United States
Department of
Agriculture

Natural
Resources
Conservation
Service

In cooperation with
Illinois Agricultural
Experiment Station

Soil Survey of Tazewell County, Illinois

How To Use This Soil Survey

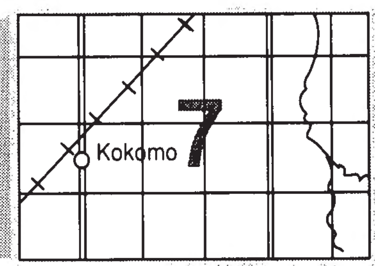
General Soil Map

The general soil map, which is the color map preceding the detailed soil maps, shows the survey area divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.

To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the color-coded map legend, then refer to the section **General Soil Map Units** for a general description of the soils in your area.

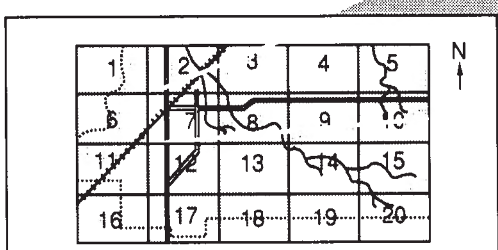
Detailed Soil Maps

The detailed soil maps follow the general soil map. These maps can be useful in planning the use and management of small areas.



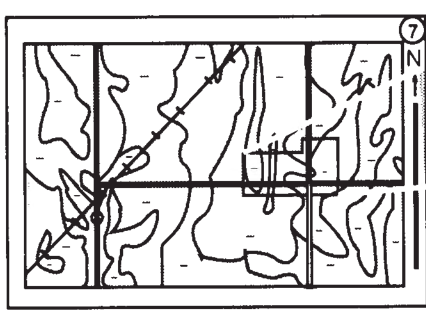
MAP SHEET

To find information about your area of interest, locate that area on the **Index to Map Sheets**, which precedes the soil maps. Note the number of the map sheet, and turn to that sheet.

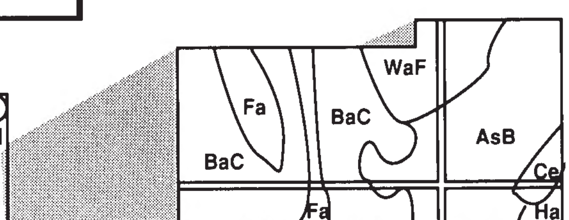


INDEX TO MAP SHEETS

Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Turn to the **Index to Map Units** (see Contents), which lists the map units by symbol and name and shows the page where each map unit is described.



MAP SHEET



AREA OF INTEREST

NOTE: Map unit symbols in a soil survey may consist only of numbers or letters, or they may be a combination of numbers and letters.

The **Summary of Tables** shows which table has data on a specific land use for each detailed soil map unit. See **Contents** for sections of this publication that may address your specific needs.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (formerly the Soil Conservation Service) has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 1988. Soil names and descriptions were approved in 1991. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1988. This survey was made cooperatively by the Natural Resources Conservation Service and the Illinois Agricultural Experiment Station. It is part of the technical assistance furnished to the Tazewell County Soil and Water Conservation District. Financial assistance was made available by the Tazewell County Board and the Illinois Department of Agriculture.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

This soil survey is Illinois Agricultural Experiment Station Soil Report 153.

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Cover: An area of cropland in Tazewell County.

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Issued August 1996

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Foreword

This soil survey contains information that can be used in land-planning programs in Tazewell County, Illinois. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

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State Conservationist
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Soil Survey of
Tazewell County, Illinois

By W.M. Teater, Natural Resources Conservation Service

Fieldwork by W.M. Teater, J.F. Steinkamp, and R.W. Sims, Natural Resources Conservation Service, and L.L. Acker, D.A. Antonacci, K.P. Black, P.D. Meyer, and S.W. Wegman, Tazewell County

United States Department of Agriculture, Natural Resources Conservation Service, in cooperation with
Illinois Agricultural Experiment Station

TAZEWELL COUNTY has an area of 420,910 acres, or about 658 square miles. It is bordered by Woodford County on the north, McLean County on the east, Logan and Mason Counties on the south, and the Illinois River on the west (fig. 1). In 1990, the population of the county was 123,692 and that of Pekin, the county seat and the largest city, was 32,254.

This soil survey updates the survey of Tazewell County published in 1916 *(4)*. It provides more information about the soils and has larger maps, which show the soils in greater detail.

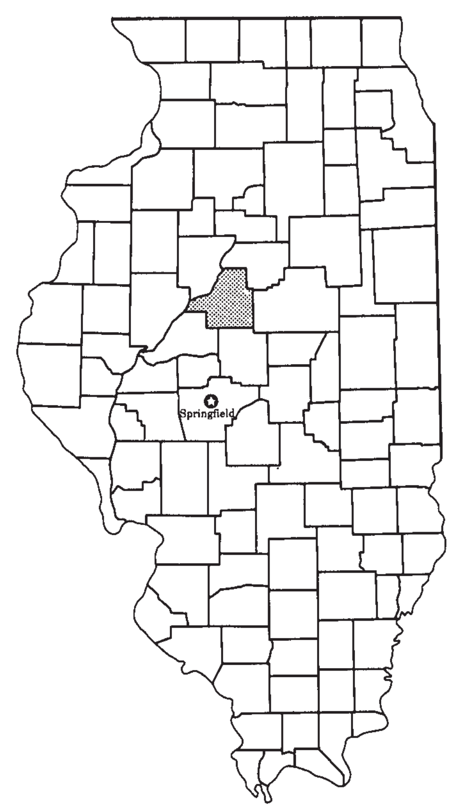

Figure 1.—Location of Tazewell County in Illinois.

General Nature of the County

This section gives general information about Tazewell County. It describes physiography, relief, and drainage; settlement; farming and industry; and climate.

Physiography, Relief, and Drainage

The soils in Tazewell County vary widely in slope, texture, and natural drainage. The southwestern part of the county is dominated by well drained to excessively drained, loamy and sandy, nearly level to sloping soils. Two major areas of flood plains are along the Illinois and Mackinaw Rivers. They are dominated by nearly level, frequently flooded to rarely flooded, poorly drained to well drained, loamy to clayey soils. Except for the areas surrounding the Mackinaw River, the eastern half of the county is dominated by nearly level and gently sloping, silty and clayey soils. These soils

commonly are poorly drained to moderately well drained soils and formed under prairie grasses. The northwestern part of the county and the area surrounding the flood plain along the Mackinaw River are dominated by nearly level to steep, loamy and silty soils. These soils commonly are somewhat poorly drained to well drained and formed under forest vegetation. Elevation in the county ranges from 430 to 850 feet above sea level.

Settlement

When the first settlers arrived the survey area in 1823, hardwoods were abundant in areas adjacent to rivers, streams, and drainageways. Tall prairie grasses covered the broad plains between the timbered areas. The early settlers were primarily hunters, living in or near areas of woodland. Crop production was relatively insignificant during the period of early settlement. Tazewell County was established in 1827.

By the 1840's, crop and livestock production had surpassed hunting in importance. By 1878, seven railroads extended through the county. Farmers used the railway system to distribute grain and livestock.

Farming and Industry

In 1987, the county had 1,182 farms, which averaged 299 acres in size. The total area of cropland was 323,850 acres, of which 16,390 acres was irrigated. About 137,850 was used for corn; 105,867 acres for soybeans; 5,507 acres for wheat; 7,071 acres for hay; and 3,286 acres for vegetable crops, such as pumpkins. Hogs and cattle were the main kinds of livestock. In 1987, farmers in the county sold 194,687 hogs and 8,548 cattle *(8)*.

Several industries are established in the county. These include manufacturers of farm and earth-moving equipment, concrete and building material, and processed food. Numerous sand and gravel pits in the valleys of the Illinois and Mackinaw Rivers provide road and building material.

Climate

Table 1 gives data on temperature and precipitation for the survey area as recorded at Peoria in the period 1961 to 1990. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter, the average temperature is 25 degrees F and the average daily minimum temperature is 17 degrees. The lowest temperature on record, which occurred at Peoria on January 17, 1977, is -25 degrees. In summer, the average temperature is 73 degrees and the average daily maximum temperature is 84 degrees. The highest recorded temperature, which occurred at Peoria on June 25, 1988, is 105 degrees.

Growing degree days are shown in table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (40 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is 36.26 inches. Of this, 22,63 inches, or about 62 percent, usually falls in April through September. The growing season for most crops falls within this period. The heaviest 1-day rainfall on record was 5.06 inches at Peoria on April 24, 1950. Thunderstorms occur on about 48 days each year, and most occur in June.

The average seasonal snowfall is 26.2 inches. The greatest snow depth at any one time during the period of record was 20 inches. On the average, 8 days of the year have at least 1 inch of snow on the ground. The heaviest 1-day snowfall on record is 12.2 inches.

The average relative humidity in midafternoon is 61 percent. Humidity is higher at night, and the average at dawn is 83 percent. The sun shines 67 percent of the time possible in summer and 46 percent in winter. The prevailing wind is from the south. Average windspeed is highest, 12.1 miles per hour, in February.

How This Survey Was Made

This survey was made to provide information about the soils in the survey area. The information includes a description of the soils and their location and a discussion of the suitability, limitations, and management of the soils for specified uses. Soil scientists observed the steepness, length, and shape of slopes; the general pattern of drainage; the kinds of crops and native plants growing on the soils; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

The soils in the survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil is associated with a particular kind of landscape or with a segment of the landscape. By observing the soils in the survey area and relating their position to specific segments of the landscape, a soil scientist develops a

concept, or model, of how the soils were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. The system of taxonomic classification used in the United States is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot assure that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Map Unit Composition

A map unit delineation on a soil map represents an area dominated by one major kind of soil or an area dominated by two or three kinds of soil. A map unit is identified and named according to the taxonomic classification of the dominant soil or soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural objects. In common with other natural objects, they have a characteristic variability in their properties. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of soils of other taxonomic classes. Consequently, every map unit is made up of the soil or soils for which it is named and some soils that belong to other taxonomic classes. These latter soils are called inclusions or included soils.

Most inclusions have properties and behavioral patterns similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting (similar) inclusions. They may or may not be mentioned in the map unit descriptions. Other inclusions, however, have properties and behavior divergent enough to affect use or require different management. These are contrasting (dissimilar) inclusions. They generally occupy small areas and cannot be shown separately on the soil maps because of the scale used in mapping. The inclusions of contrasting soils are mentioned in the map unit descriptions. A few inclusions may not have been observed and consequently are not mentioned in the descriptions, especially where the soil pattern was so complex that it was impractical to make enough observations to identify all of the kinds of soil on the landscape.

The presence of inclusions in a map unit in no way diminishes the usefulness or accuracy of the soil data. The objective of soil mapping is not to delineate pure taxonomic classes of soils but rather to separate the landscape into segments that have similar use and management requirements. The delineation of such landscape segments on the map provides sufficient information for the development of resource plans, but onsite investigation is needed to plan for intensive uses in small areas.

General Soil Map Units

The general soil map at the back of this publication shows the soil associations in this survey area. Each association has a distinctive pattern of soils, relief, and drainage. Each is a unique natural landscape. The associations consist of two or more major soils and some minor soils. The soils making up one association can occur in another but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The soils in any one association differ from place to place in slope, depth, drainage, and other characteristics that affect management.

The general soil map of Tazewell County joins with the general soil maps of Logan and Mason Counties. The names of some of the associations in these counties do not agree with those of the associations in Tazewell County because of differences in the composition of the associations. These differences do not significantly affect the use of the maps for general planning.

Nearly Level to Sloping Soils That Are Moderately Permeable or Moderately Slowly Permeable; on Uplands and Terraces

The major management needs on these soils are measures that maintain the drainage system and control erosion. Ponding is the major hazard.

1. Ipava-Sable Association

Nearly level, somewhat poorly drained and poorly drained, silty soils that formed in loess

This association consists mainly of nearly level Ipava soils on broad plains and nearly level Sable soils on broad plains and in drainageways.

This association makes up about 20 percent of the county. It is about 47 percent Ipava soils, 38 percent Sable soils, and 15 percent soils of minor extent (fig. 2).

Ipava soils are somewhat poorly drained. Typically, the surface soil is very dark gray, friable silt loam about 18 inches thick. The subsoil is friable silty clay loam about 33 inches thick. The upper part is dark grayish brown, the next part is dark grayish brown and mottled, and the lower part is light olive brown and mottled. The underlying material to a depth of about 60 inches is light olive brown, mottled, friable silt loam.

Sable soils are poorly drained. Typically, the surface layer is black, firm silty clay loam about 8 inches thick. The subsurface layer also is black, firm silty clay loam. It is about 7 inches thick. The subsoil extends to a depth of about 60 inches. It is mottled and firm. The upper part is dark gray and dark grayish brown silty clay loam, the next part is grayish brown silty clay loam, and the lower part is grayish brown silt loam.

Of minor extent in this association are the moderately well drained or well drained Tama soils and the poorly drained Harpster soils. Tama soils are on ridges and side slopes. Harpster soils are in shallow depressions.

In most areas the major soils in this association are used for cultivated crops. In some areas, however, they are used as sites for dwellings or for local roads and streets.

The major soils are well suited to cultivated crops. Subsurface drainage systems have been installed in most areas. Measures that maintain the drainage system are needed. Ponding is the major hazard.

The Ipava soils are poorly suited to dwellings, septic tank absorption fields, and local roads and streets. The seasonal high water table, the shrink-swell potential, low strength, and the potential for frost action are the main limitations on sites for dwellings or for local roads and streets. The seasonal high water table and slow permeability are the main limitations on sites for septic tank absorption fields. The Sable soils are generally unsuited to dwellings and septic tank absorption fields because of the hazard of ponding.

2. Tama-Ipava-Sable Association

Nearly level to sloping, well drained to poorly drained soils that formed in loess

This association consists mainly of gently sloping and sloping Tama soils on ridges and side slopes, nearly

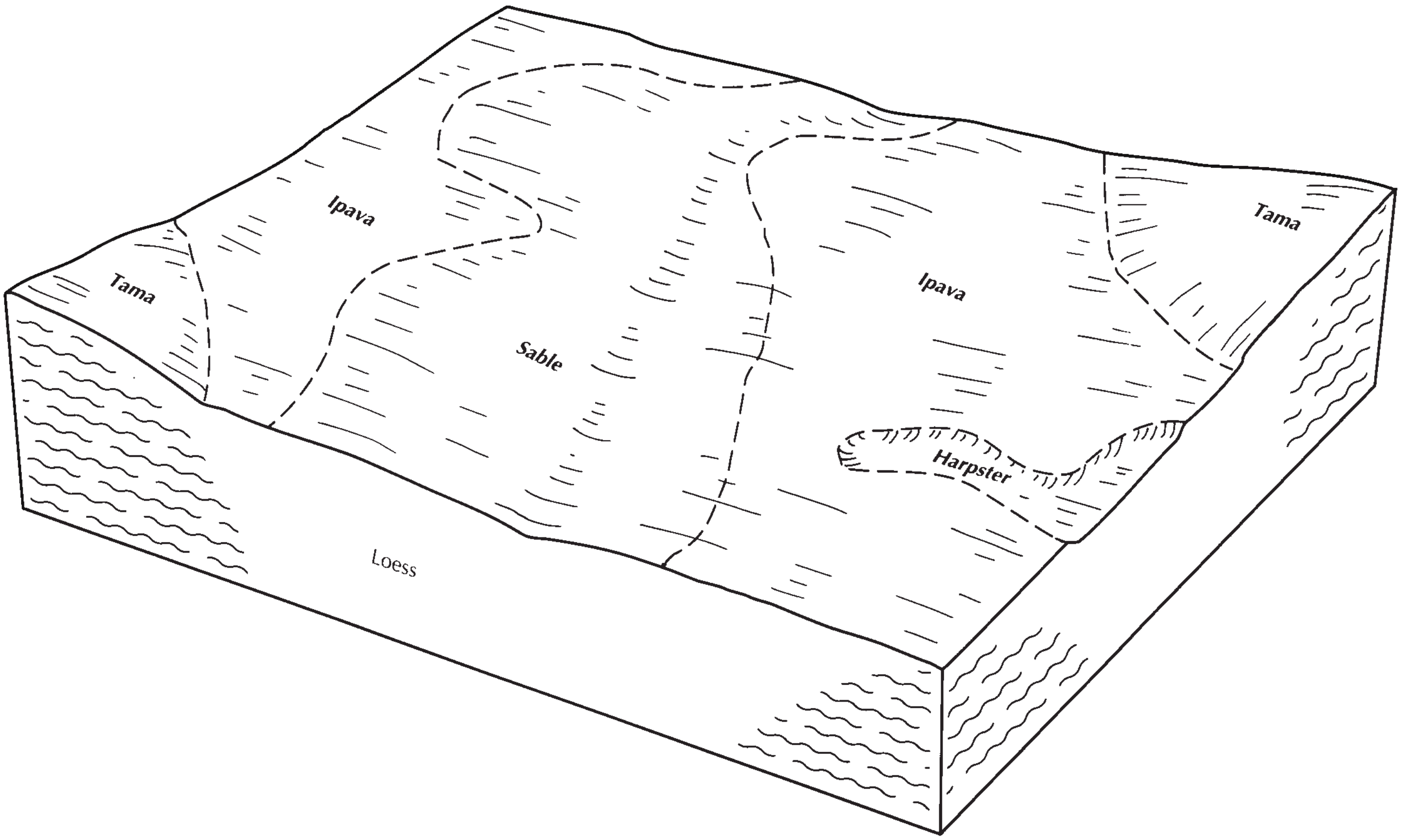

Figure 2.—Typical pattern of soils and parent material in the Ipava-Sable association.

level Ipava soils on broad plains, and nearly level Sable soils on broad plains and in drainageways.

This association makes up about 20 percent of the county. It is about 49 percent Tama soils, 22 percent Ipava soils, 13 percent Sable soils, and 16 percent soils of minor extent.

Tama soils are moderately well drained or well drained. Typically, the surface soil is very dark grayish brown, friable silt loam about 12 inches thick. The subsoil is about 43 inches thick. The upper part is brown and dark yellowish brown, friable and firm silty clay loam; the next part is dark yellowish brown, mottled, firm silty clay loam; and the lower part yellowish brown, mottled, friable silt loam. The underlying material to a depth of about 60 inches also is yellowish brown, mottled, friable silt loam.

Ipava soils are somewhat poorly drained. Typically, the surface soil is very dark gray, friable silt loam about 18 inches thick. The subsoil is friable silty clay loam about 33 inches thick. The upper part is dark grayish brown, the next part is dark grayish brown and mottled, and the lower part is light olive brown and mottled. The underlying material to a depth of about 60 inches is light olive brown, mottled, friable silt loam.

Sable soils are poorly drained. Typically, the surface layer is black, firm silty clay loam about 8 inches thick. The subsurface layer also is black, firm silty clay loam. It is about 7 inches thick. The subsoil extends to a depth of about 60 inches. It is mottled and firm. The upper part is dark gray and dark grayish brown silty clay loam, the next part is grayish brown silty clay loam, and the lower part is grayish brown silt loam.

Of minor extent in this association are the moderately well drained Catlin soils, the well drained Saybrook soils, and the poorly drained Sawmill soils. Catlin and Saybrook soils are on side slopes near drainageways. Sawmill soils are on flood plains.

In most areas the major soils in this association are cultivated. They are well suited to cultivated crops in nearly level and gently sloping areas and moderately suited in sloping areas. Subsurface drainage systems have been installed in most areas where the seasonal

high water table is a limitation. Measures that maintain the drainage system are needed. Erosion and ponding are the major hazards.

The Ipava soils are poorly suited to dwellings and septic tank absorption fields, mainly because of the seasonal high water table and restricted permeability, and the Sable soils are generally unsuited because of the hazard of ponding. The Tama soils are well suited to dwellings and septic tank absorption fields in sloping areas and moderately suited in gently sloping areas. The main management concerns are the seasonal high water table and the shrink-swell potential.

3. Plano-Elburn-Sable Association

Nearly level and gently sloping, well drained to poorly drained soils that formed in loess or in silty material over stratified sediments

This association consists mainly of nearly level and gently sloping Plano soils on broad plains and side slopes, nearly level Elburn soils on broad plains, and nearly level Sable soils on broad plains and in drainageways.

This association makes up about 4 percent of the county. It is about 57 percent Plano and similar soils, 11 percent Elburn and similar soils, 8 percent Sable and similar soils, and 24 percent soils of minor extent.

Plano soils are well drained or moderately well drained. Typically, the surface layer is very dark grayish brown, friable silt loam about 9 inches thick. The subsurface layer also is very dark grayish brown, friable silt loam. It is about 4 inches thick. The subsoil is about 40 inches thick. It is friable. In sequence downward, it is dark yellowish brown silty clay loam; yellowish brown, mottled silty clay loam; dark yellowish brown, mottled silt loam; and dark yellowish brown sandy loam. The underlying material to a depth of about 60 inches is light olive gray, mottled, friable, stratified silt loam to sandy loam.

Elburn soils are somewhat poorly drained. Typically, the surface layer is very dark brown, friable silt loam about 21 inches thick. The subsoil is about 55 inches thick. It is mottled and friable. The upper part is brown silt loam, the next part is yellowish brown and light olive brown silty clay loam, and the lower part is light olive brown silt loam. The underlying material to a depth of about 85 inches is light olive brown, mottled, friable, stratified silt loam, silty clay loam, and loam.

Sable soils are poorly drained. Typically, the surface layer is black, firm silty clay loam about 8 inches thick. The subsurface layer also is black, firm silty clay loam. It is about 7 inches thick. The subsoil extends to a depth of about 60 inches. It is mottled and firm. The upper part is dark gray and dark grayish brown silty clay loam, the next part is grayish brown silty clay loam, and the lower part is grayish brown silt loam.

Of minor extent in this association are the well drained Camden soils and the poorly drained Edgington and Selma soils. Camden soils are on the higher parts of ridges. Edgington and Selma soils are on broad plains and in shallow depressions.

In most areas the major soils in this association are cultivated. They are well suited to the cultivated crops commonly grown in the county. Subsurface drainage systems have been installed in most areas where the seasonal high water is a limitation. Measures that maintain the drainage system are needed. Erosion and ponding are the major hazards.

The Elburn soils generally are poorly suited to dwellings and septic tank absorption fields, mainly because of the seasonal high water table; the Plano soils are only moderately suited, mainly because of the seasonal high water table and the shrink-swell potential; and the Sable soils are generally unsuited because of the hazard of ponding.

Nearly level to Very Steep Soils That Are Moderately Permeable or Moderately Slowly Permeable; on Uplands

The major management needs on these soils are measures that maintain the drainage system and control erosion.

4. Rozetta-Stronghurst Association

Nearly level and gently sloping, moderately well drained and somewhat poorly drained, silty soils that formed in loess

This association consists mainly of gently sloping Rozetta soils on side slopes and nearly level Stronghurst soils on broad plains.

This association makes up about 11 percent of the county. It is about 43 percent Rozetta soils, 28 percent Stronghurst soils, and 29 percent soils of minor extent (fig. 3).

Rozetta soils are moderately well drained. Typically, the surface layer is brown, friable silt loam about 7 inches thick. The subsoil is friable silty clay loam about 37 inches thick. The upper part is dark yellowish brown and yellowish brown, and the lower part is yellowish brown and mottled. The underlying material to a depth of about 60 inches is yellowish brown, mottled, friable silt loam.

Stronghurst soils are somewhat poorly drained. Typically, the surface layer is dark grayish brown, friable silt loam about 7 inches thick. The subsurface layer is grayish brown, friable silt loam about 5 inches thick. The subsoil is about 35 inches thick. It is brown

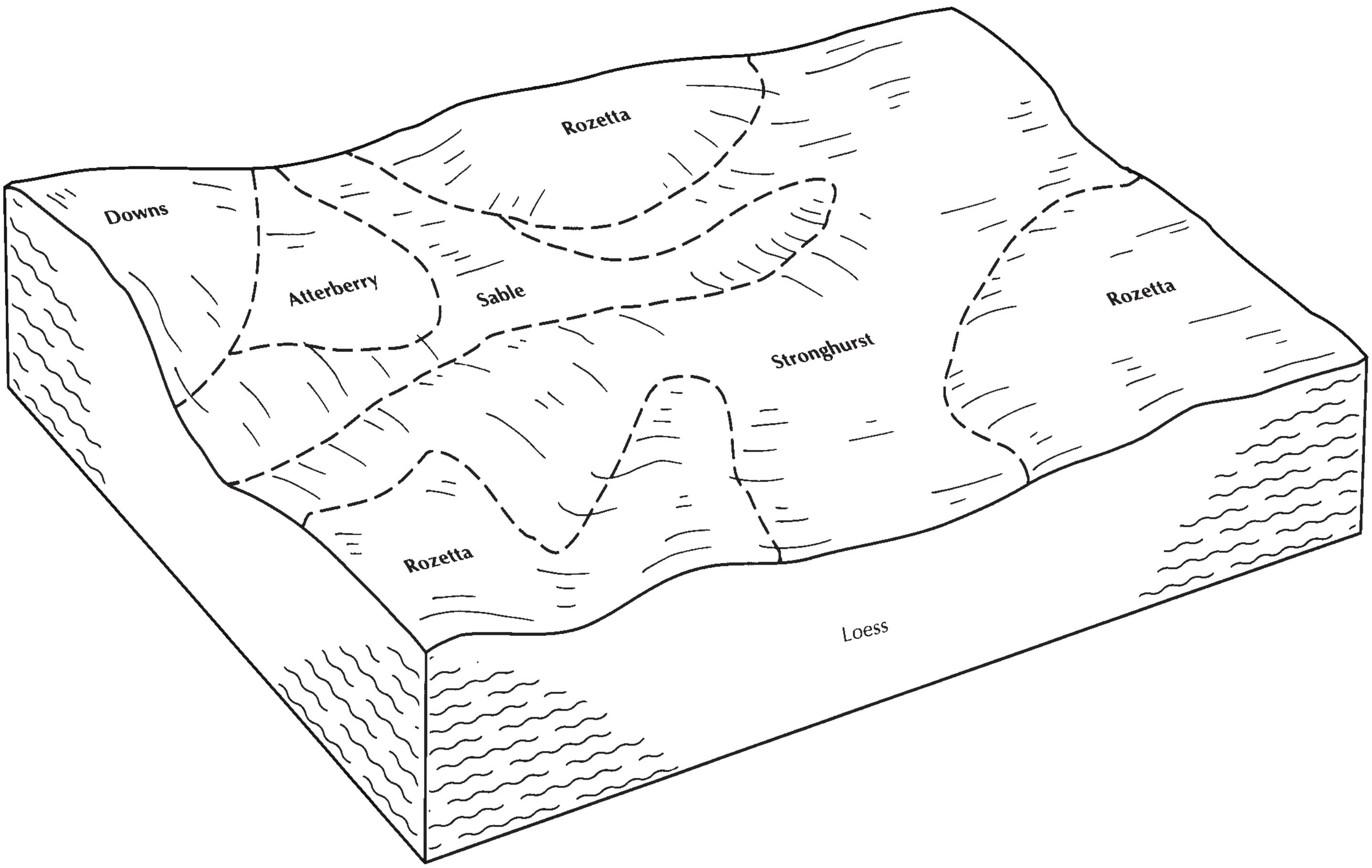

Figure 3.—Typical pattern of soils and parent material in the Rozetta-Stronghurst association.

and mottled. The upper part is firm silty clay loam, and the lower part is friable silt loam. The underlying material to a depth of about 60 inches is mottled yellowish brown and light brownish gray, friable silt loam.

Of minor extent in this association are the somewhat poorly drained Atterberry soils, the moderately well drained Downs soils, and the poorly drained Sable soils. Atterberry soils are on nearly level, broad plains bordering prairie areas. Downs soils are on ridges and side slopes bordering prairie areas. Sable soils are in shallow depressions and drainageways.

In most areas the major soils in this association are used for cultivated crops. In some areas, however, they are used as sites for dwellings or for local roads and streets.

The major soils are well suited to cultivated crops. Subsurface drainage systems have been installed in most areas where the seasonal high water table is a limitation. Measures that maintain the drainage system are needed. Erosion is the major hazard.

The gently sloping soils are moderately suited to dwellings and septic tank absorption fields, and the nearly level soils are poorly suited. The major soils are poorly suited to local roads and streets. The seasonal high water table, the shrink-swell potential, low strength, and the potential for frost action are the major limitations.

5. Birkbeck-Miami-Hennepin Association

Sloping to very steep, well drained and moderately well drained soils that formed in glacial till or in loess and glacial till

This association consists mainly of sloping and strongly sloping Birkbeck soils on ridges and side slopes, sloping to very steep Miami soils on ridges and side slopes, and steep and very steep Hennepin soils on nose slopes and side slopes.

This association makes up about 17 percent of the

county. It is about 40 percent Birkbeck and similar soils, 22 percent Miami soils, 15 percent Hennepin and similar soils, and 23 percent soils of minor extent (fig. 4).

Birkbeck soils are well drained or moderately well drained. Typically, the surface layer is mixed dark grayish brown and dark yellowish brown, friable silt loam about 7 inches thick. The subsoil is about 40 inches thick. The upper part is dark yellowish brown, firm silty clay loam; the next part is yellowish brown, firm silty clay loam and friable silt loam; and the lower part is yellowish brown, friable loam. The underlying material to a depth of about 60 inches also is yellowish brown, friable loam. It is calcareous in the lower part.

Miami soils are well drained. Typically, the surface layer is brown, friable silt loam about 7 inches thick. The subsoil is about 32 inches thick. It is yellowish brown. The upper part is friable silty clay loam, and the lower part is firm clay loam and loam. The underlying material to a depth of about 60 inches is yellowish brown, firm, calcareous loam.

Hennepin soils are well drained. Typically, the surface layer is very dark grayish brown, friable loam about 5 inches thick. The subsoil is friable, calcareous loam about 11 inches thick. The upper part is brown, and the lower part is yellowish brown. The underlying material to a depth of about 60 inches is yellowish brown, friable, calcareous loam.

Of minor extent in this association are the moderately well drained Rozetta soils, the somewhat poorly drained Radford soils, and the poorly drained Sawmill soils. Rozetta soils formed entirely in loess. They are on ridges. Radford and Sawmill soils are on flood plains.

This association is used mainly for woodland and woodland wildlife habitat. Some of the less sloping areas are used for pasture or cultivated crops. Some

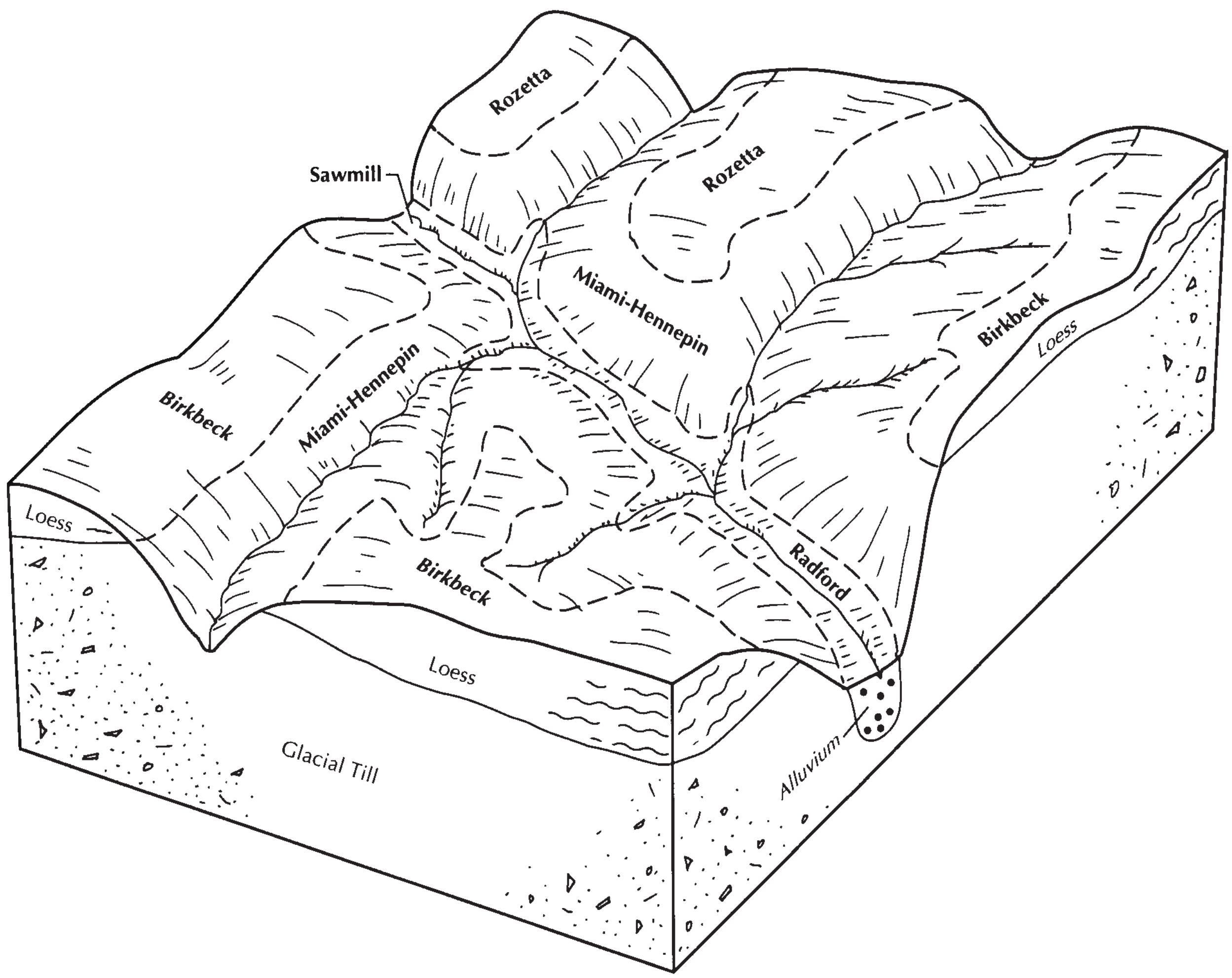

Figure 4.—Typical pattern of soils and parent material in the Birkbeck-Miami-Hennepin association.

areas are used sites for dwellings or for local roads and streets.

The gently sloping and sloping soils are well suited or moderately suited to cultivated crops and to pasture and hay. The strongly sloping soils are moderately suited or poorly suited to pasture and poorly suited to cultivated crops. The steep and very steep soils are generally unsuited to cultivated crops and poorly or generally unsuited to pasture and hay. Erosion is the major hazard, and the slope is the major limitation.

The gently sloping to strongly sloping soils are well suited to woodland, and the steep and very steep soils are moderately suited or poorly suited. Erosion is the major hazard, and the slope is the major limitation. Woodland wildlife is abundant in areas where habitat is available.

The gently sloping to strongly sloping soils are moderately suited to dwellings, moderately suited or poorly suited to septic tank absorption fields, and poorly suited to local roads and streets. The steep and very steep soils are generally unsuited to dwellings and to local roads and streets. Restricted permeability, the slope, the shrink-swell potential, and low strength are the major limitations.

Nearly Level Soils That Are Moderately Slowly Permeable or Moderately Permeable; on Terraces

The major management needs on these soils are measures that maintain the drainage system. Ponding is the major hazard.

6. Selma-Harpster-Orio Association

Nearly level, poorly drained, loamy soils that formed in loamy sediments or in loamy and sandy sediments

This association consists mainly of nearly level Selma and Harpster soils on broad plains and nearly level Orio soils on broad plains and in shallow depressions.

This association makes up about 3 percent of the county. It is about 26 percent Selma soils, 24 percent Harpster and similar soils, 14 percent Orio soils, and 36 percent soils of minor extent.

Typically, the surface layer of the Selma soils is black, friable loam about 9 inches thick. The subsurface layer is very dark gray, friable loam about 13 inches thick. The subsoil is mottled, friable loam about 28 inches thick. The upper part is dark gray, and the lower part is gray. The underlying material to a depth of about 60 inches is light olive gray, mottled, friable silt loam and loam.

Typically, the surface soil of the Harpster soils is black, calcareous, firm silty clay loam about 12 inches thick. The subsoil is about 30 inches thick. It is mottled and calcareous. The upper part is dark gray and grayish brown silty clay loam, and the lower part is light brownish gray silt loam. The underlying material to a depth of about 60 inches is gray, mottled, calcareous, friable silt loam.

Typically, the surface layer of the Orio soils is mixed very dark gray and dark grayish brown, friable fine sandy loam about 9 inches thick. The subsurface layer is about 12 inches of grayish brown, very friable loamy fine sand and fine sandy loam. The subsoil is about 22 inches thick. It is mottled and friable. The upper part is grayish brown loam, the next part is grayish brown clay loam, and the lower part is light brownish gray fine sandy loam. The underlying material to a depth of about 60 inches is light olive gray and light gray, mottled, friable, stratified fine sandy loam, sandy clay loam, and loamy fine sand.

Of minor extent in this association are the somewhat poorly drained Elburn and La Hogue soils and the poorly drained Shiloh and Will soils. Elburn and La Hogue soils are in the slightly higher areas. Shiloh and Will soils are in the slightly lower areas.

In most areas the major soils in this association are cultivated. They are well suited to cultivated crops. Subsurface drainage systems have been installed in most areas. Measures that maintain the drainage system are needed. Ponding is the major hazard.

The major soils are poorly suited or generally unsuited to dwellings and septic tank absorption fields because of the seasonal high water table and the hazard of ponding.

Nearly Level to Very Steep Soils That Are Moderately Permeable to Rapidly Permeable; on Terraces

The major management concerns in areas of these soils are an adequate moisture supply and the hazard of erosion.

7. Onarga-Jasper-Dakota Association

Nearly level to sloping, well drained, loamy soils that formed in loamy and sandy material or in loamy sediments over sandy material

This association consists mainly of nearly level to sloping Onarga soils on ridges and side slopes, nearly level Jasper soils on broad plains, and nearly level and gently sloping Dakota soils on broad plains and side slopes.

This association makes up about 9 percent of the county. It is about 29 percent Onarga and similar soils, 20 percent Jasper soils, 18 percent Dakota soils, and 33 percent soils of minor extent (fig. 5).

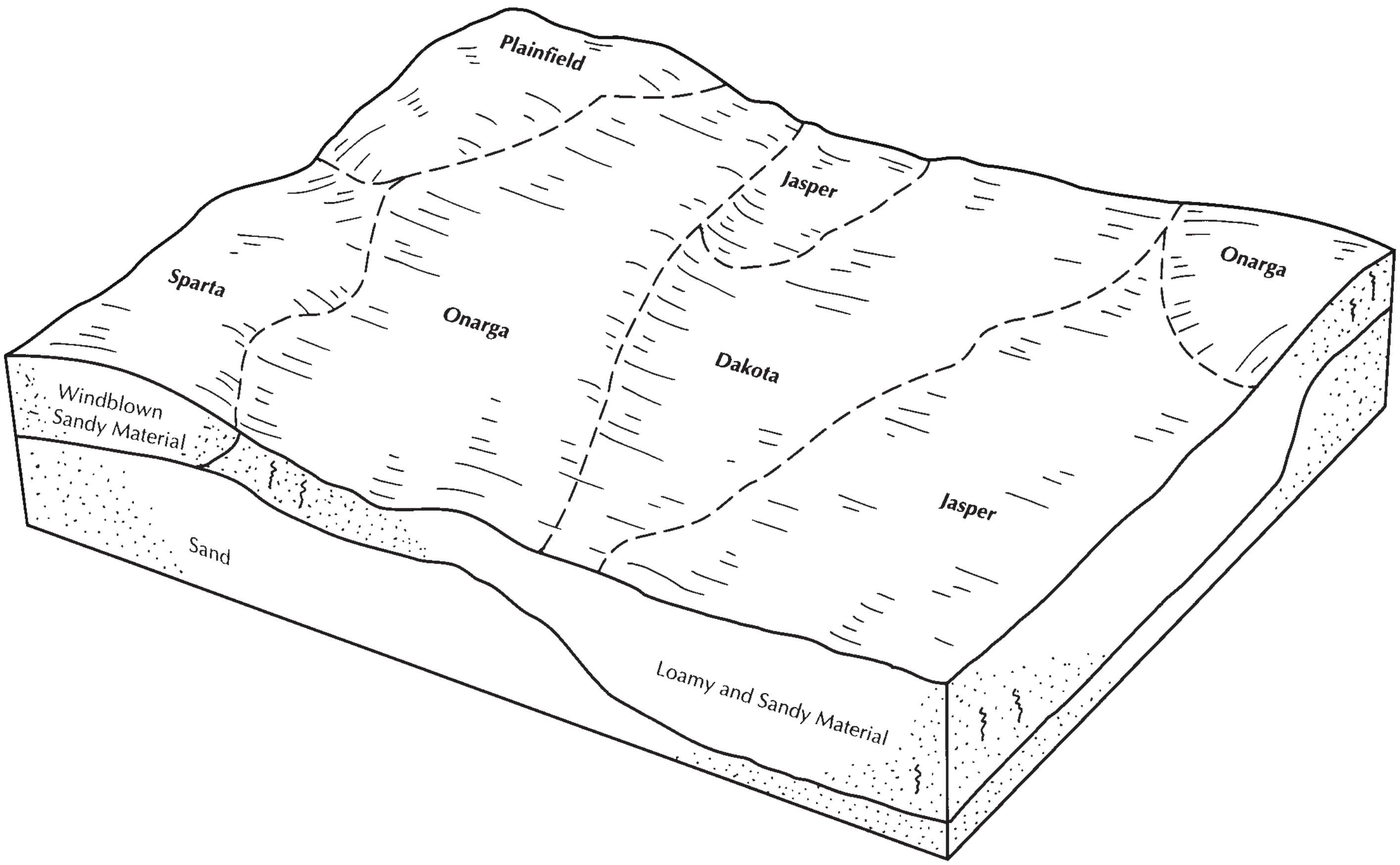

Figure 5.—Typical pattern of soils and parent material in the Onarga-Jasper-Dakota association.

Typically, the surface layer of the Onarga soils is very dark grayish brown, friable sandy loam about 11 inches thick. The subsoil is about 22 inches thick. It is dark brown and brown. The upper part is friable loam, and the lower part is very friable loamy sand. The underlying material to a depth of about 60 inches is brown, loose loamy sand.

Typically, the surface layer of the Jasper soils is very dark grayish brown, friable loam about 8 inches thick. The subsurface layer is very dark grayish brown and dark brown, friable loam about 10 inches thick. The subsoil is about 28 inches thick. It is friable. The upper part is dark brown clay loam, the next part is dark yellowish brown loam, and the lower part is brown loam. The underlying material to a depth of about 60 inches is brown, very friable loamy sand and sand.

Typically, the surface layer of the Dakota soils is very dark grayish brown, friable loam about 10 inches thick. The subsoil is about 27 inches thick. The upper part is dark brown, friable loam; the next part is dark yellowish brown, friable clay loam, loam, and sandy clay loam; and the lower part is dark brown, very friable loamy sand. The underlying material to a depth of about 60 inches is dark brown and loose. The upper part is coarse sand, and the lower part is loamy coarse sand.

Of minor extent in this association are the excessively drained Plainfield and Sparta soils. These soils are in gently sloping to very steep areas of wind-worked sand.

In most areas the major soils in this association are used for cultivated crops. In some areas, however, they are used as sites for dwellings or for local roads and streets.

The major soils are well suited or moderately suited to cultivated crops. The available water capacity is the major limitation. Soil blowing and erosion are the major hazards.

The major soils are well suited to dwellings and moderately suited to local roads and streets. Low strength and the potential for frost action are the major limitations. The Jasper soils are well suited to septic tank absorption fields, but the Onarga and Dakota soils are poorly suited because of rapid permeability.

8. Plainfield-Onarga-Sparta Association

Nearly level to very steep, excessively drained and well drained, sandy and loamy soils that formed in sandy windblown material or in loamy and sandy material

This association consists mainly of soils on ridges and side slopes. Plainfield soils are gently sloping to very steep, Onarga soils are nearly level to sloping, and Sparta soils are gently sloping to strongly sloping.

This association makes up about 4 percent of the county. It is about 44 percent Plainfield and similar soils, 31 percent Onarga and similar soils, 19 percent Sparta soils, and 6 percent soils of minor extent (fig. 6).

Plainfield soils are excessively drained. Typically, the surface layer is dark brown, very friable sand about 5 inches thick. The subsoil is brown, very friable sand about 27 inches thick. The underlying material to a depth of about 60 inches is dark yellowish brown, loose sand.

Onarga soils are well drained. Typically, the surface layer is very dark grayish brown, friable sandy loam about 11 inches thick. The subsoil is about 22 inches thick. It is dark brown and brown. The upper part is friable loam, and the lower part is very friable loamy sand. The underlying material to a depth of about 60 inches is brown, loose loamy sand.

Sparta soils are excessively drained. Typically, the surface layer is very dark brown, very friable loamy sand about 10 inches thick. The subsurface layer is very dark grayish brown, very friable sand about 8 inches thick. The subsoil is very friable sand about 19 inches thick. The upper part is dark yellowish brown, and the lower part is yellowish brown. The underlying material to a depth of about 60 inches is yellowish brown, loose sand.

Of minor extent in this association are the well drained Alvin and Jasper soils, the excessively drained Coloma soils, and the somewhat excessively drained Disco soils. Alvin soils are on ridges and side slopes bordering timbered areas. Coloma and Disco soils are

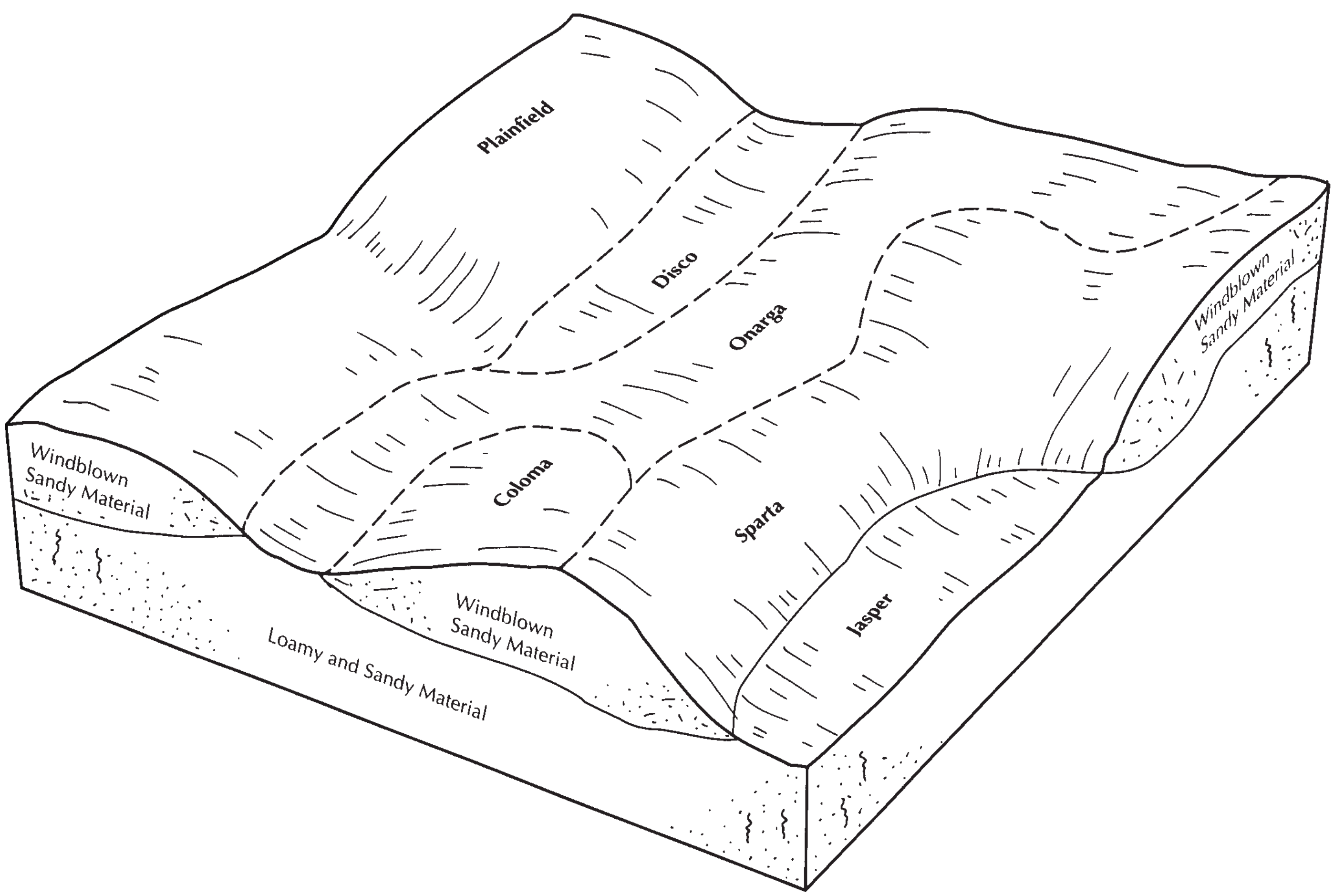

Figure 6.—Typical pattern of soils and parent material in the Plainfield-Onarga-Sparta association.

on ridges and side slopes. Jasper soils are on the lower parts of the landscape.

In most areas the major soils in this association are used for cultivated crops or for pasture or hay. The Onarga soils are moderately suited to cultivated crops, pasture, and hay, and the gently sloping Plainfield and Sparta soils are poorly suited. The strongly sloping soils are generally unsuited to row crops and poorly suited to small grain. The very steep soils are generally unsuited to cultivated crops. The slope and droughtiness are the major limitations. Soil blowing and erosion are the major hazards.

The major soils generally are well suited to dwellings. The slope is a limitation in the more sloping areas. The soils are poorly suited to septic tank absorption fields because of rapid permeability.

Nearly Level Soils That Are Slowly Permeable to Rapidly Permeable; on Flood Plains

The major management needs on these soils are measures that reduce the hazards of flooding and ponding.

9. Ross-Landes-Lawson Association

Nearly level, well drained and somewhat poorly drained, frequently flooded, loamy and silty soils that formed in alluvium

This association consists mainly of nearly level Ross, Landes, and Lawson soils on flood plains.

This association makes up about 8 percent of the county. It is about 36 percent Ross and similar soils, 17 percent Landes and similar soils, 8 percent Lawson and similar soils, and 39 percent soils of minor extent.

Ross soils are well drained. Typically, the surface layer is very dark gray, friable silt loam about 8 inches thick. The subsurface layer is very dark grayish brown, friable silt loam about 5 inches thick. The subsoil is loam about 30 inches thick. The upper part is very dark grayish brown and friable, and the lower part is dark brown and brown and is friable and very friable. The underlying material to a depth of about 60 inches is brown, mottled, very friable sandy loam.

Landes soils are well drained. Typically, the surface layer is very dark grayish brown, friable fine sandy loam about 5 inches thick. The subsurface layer is very dark gray and very dark grayish brown, friable fine sandy loam about 16 inches thick. The subsoil is brown fine sandy loam about 18 inches thick. The upper part is very friable, and the lower part is friable. The underlying material to a depth of about 60 inches is brown, loose and friable, stratified loamy fine sand and fine sandy loam.

Lawson soils are somewhat poorly drained. Typically, the surface layer is very dark gray and black, friable silt loam about 32 inches thick. The subsurface layer is dark grayish brown, mottled, friable silty clay loam about 8 inches thick. The underlying material to a depth of about 60 inches is mottled, friable, and calcareous. The upper part is dark grayish brown loam, sandy loam, and silt loam, and the lower part is light brownish gray loam and sandy loam.

Of minor extent in this association are the well drained St. Charles and Warsaw soils, the well drained or moderately well drained Plano soils, and the excessively drained Rodman soils. All of these soils are on terraces above the flood plains.

In most areas the major soils in this association are cultivated. The Ross and Lawson soils are moderately suited to cultivated crops, and the Landes soils are poorly suited. The available water capacity is the major limitation. Flooding and ponding are the major hazards.

The major soils are generally unsuited to dwellings and septic tank absorption fields because of the hazards of flooding and ponding.

10. Titus-Ambraw-Beaucoup Association

Nearly level, poorly drained, rarely flooded, clayey, silty, and loamy soils that formed in alluvium

This association consists mainly of nearly level Titus, Ambraw, and Beaucoup soils on flood plains.

This association makes up about 4 percent of the county. It is about 39 percent Titus soils, 28 percent Ambraw soils, 9 percent Beaucoup soils, and 24 percent soils of minor extent (fig. 7).

Typically, the surface soil of the Titus soils is very dark gray, firm silty clay about 11 inches thick. The subsoil extends to a depth of about 60 inches. It is mottled and firm. The upper part is dark gray silty clay, the next part is gray silty clay and silty clay loam, and the lower part is gray silty clay loam.

Typically, the surface layer of the Ambraw soils is very dark gray, friable loam about 10 inches thick. The subsurface layer is very dark gray, friable silty clay loam about 6 inches thick. The subsoil is about 36 inches thick. The upper part is dark grayish brown, firm and friable clay loam; the next part is dark grayish brown, friable loam; and the lower part is grayish brown, friable loam. The underlying material to a depth of about 60 inches is gray, very friable and loose, stratified sandy loam and sand.

Typically, the surface layer of the Beaucoup soils is very dark grayish brown, firm silty clay loam about 6 inches thick. The subsurface layer is very dark gray, mottled, firm silty clay loam about 5 inches thick. The subsoil to a depth of about 60 inches is mottled, firm silty clay loam. The upper part is dark gray, the next

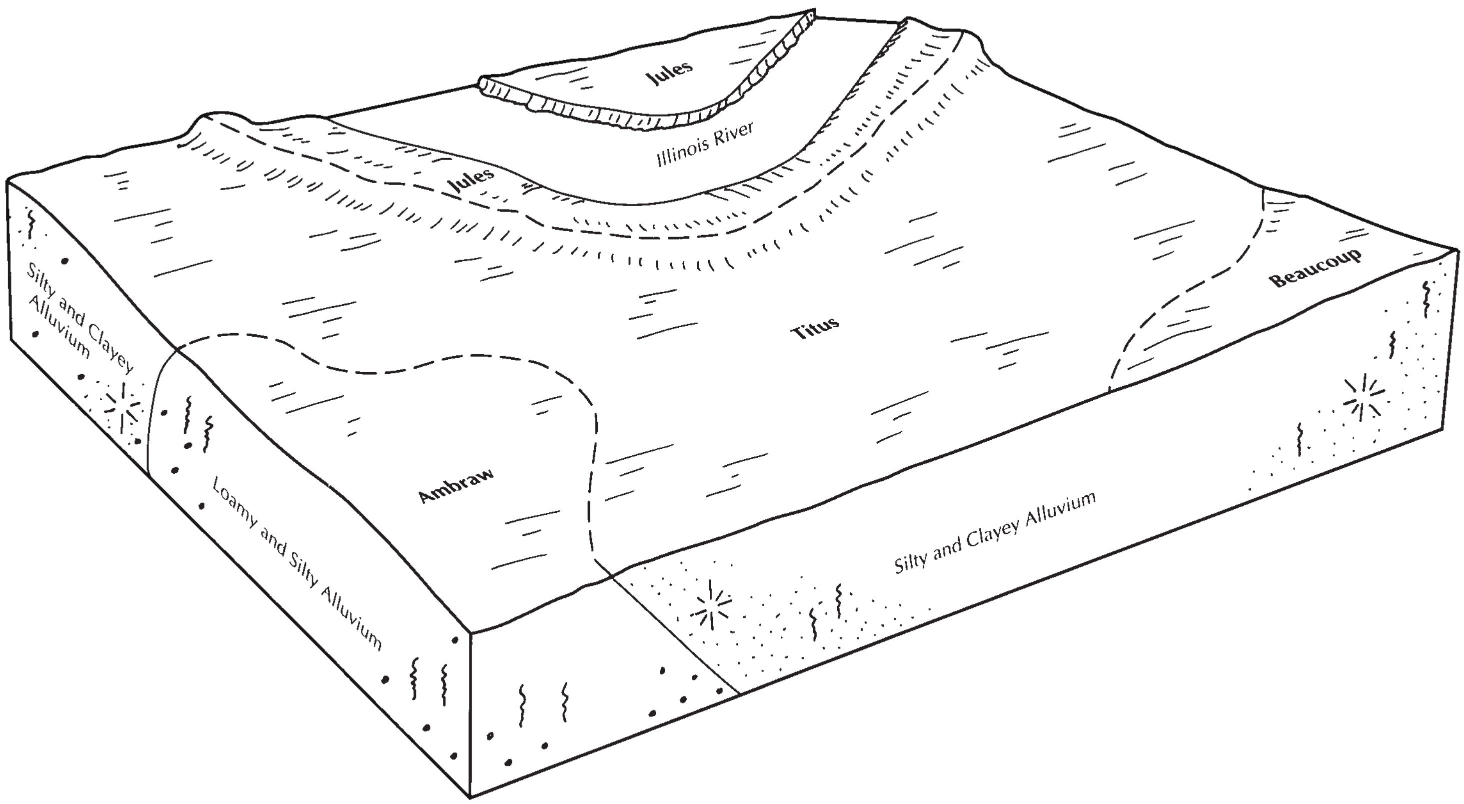

Figure 7.—Typical pattern of soils and parent material in the Titus-Ambraw-Beaucoup association.

part is grayish brown, and the lower part is dark gray.

Of minor extent in this association are Urban land, loamy Orthents, and the moderately well drained Jules soils. The Urban land and loamy Orthents are in built-up areas in East Peoria. Jules soils are on the unprotected side of the levee on the flood plain along the Illinois River.

In most areas the major soils this association are cultivated. They are well suited to the cultivated crops commonly grown in the county. Subsurface drainage systems have been installed in most areas. Measures that maintain the drainage system are needed. Ponding and flooding are the major hazards.

The major soils are generally unsuited to dwellings and septic tank absorption fields because of the hazards of flooding and ponding.

Broad Land Use Considerations

The soils in Tazewell County vary widely in their suitability for major land uses. About 70 percent of the acreage in the county is used for cultivated crops, including corn, soybeans, and small grain. The soils on most of this acreage are suitable for cultivated crops. Cropland is the major land use in all of the associations, except for association 5. The seasonal high water table has been effectively lowered in most areas where it is a limitation. Measures that maintain the drainage system are needed. Ponding is the major hazard in areas of associations 1 and 6. Erosion is the major hazard in areas of associations 2, 3, 4, and 5. The hazards of soil blowing and erosion and a limited available water capacity are the major management concerns in areas of associations 7 and 8. Irrigation can help to compensate for the limited available water capacity in these areas. Flooding and ponding are the major hazards in areas of associations 9 and 10.

About 5 percent of the acreage in the county is used for pasture or hay. Most of the pasture and hayland is in areas of association 8. The soils in this association are moderately suited or poorly suited to pasture and hay. The major limitations are the available water capacity, the slope, and droughtiness. Erosion and soil blowing are the major hazards.

About 4 percent of the acreage in the county is used as woodland. Most of the woodland is in areas of association 5. Most of the soils in this association are well suited to woodland, but the steep soils are

moderately suited and the very steep soils are poorly suited. The slope is the major limitation, and erosion is the major hazard.

Urban land is in some areas of associations 1, 4, 5, 7, and 10. The seasonal high water table and the shrink-swell potential are the major limitations on sites for dwellings. Low strength and the potential for frost action are the major limitations on sites for local roads and streets.

Detailed Soil Map Units

The map unit descriptions in this section, along with the soil maps, can be used to determine the suitability and potential of a soil for specific uses. They also can be used to plan the management needed for those uses. More information on each map unit, or soil, is given under the heading "Use and Management of the Soils."

Each map unit on the detailed soil maps represents an area on the landscape and consists of one or more soils for which the unit is named.

A symbol identifying the soil precedes the map unit name in the soil descriptions. Each description includes general facts about the soil and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer or of the underlying material, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer or of the underlying material. They also can differ in slope, stoniness, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Plainfield sand, 3 to 7 percent slopes, is a phase of the Plainfield series.

Some map units are made up of two or more major soils. These map units are called soil complexes. A *soil complex* consists of two or more soils, or one or more soils and a miscellaneous area, in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils are somewhat similar in all areas. Miami-Hennepin complex, 20 to 35 percent slopes, is an example.

Most map units include small scattered areas of soils other than those for which the map unit is named. Some of these included soils have properties that differ substantially from those of the major soil or soils. Such differences could significantly affect use and management of the soils in the map unit. The included soils are identified in each map unit description. Some small areas of strongly contrasting soils are identified by a special symbol on the soil maps.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Pits, gravel, is an example. Miscellaneous areas are shown on the soil maps. Some that are too small to be shown are identified by a special symbol on the soil maps.

Because of differences in the extent of the soils, the names of some map units in Tazewell County do not completely agree with those on the soil maps of Logan and Mason Counties, which are adjacent to this survey area. Because the soils are similar, however, these differences do not significantly affect use and management.

Table 4 gives the acreage and proportionate extent of each map unit. Other tables (see "Summary of Tables") give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils.

Soil Descriptions

19C2—Sylvan silt loam, 5 to 10 percent slopes, eroded. This sloping, well drained soil is on uplands. Individual areas range from 3 to 80 acres in size.

Typically, the surface layer is brown, friable silt loam about 7 inches thick. The subsoil is about 26 inches thick. The upper part is dark yellowish brown, friable silty clay loam, and the lower part is yellowish brown, very friable silt loam. The underlying material to a depth of about 60 inches is brownish yellow, very friable, calcareous silt. In some places the surface layer is thinner. In other places slopes are less than 5 percent. In some areas the calcareous underlying material is farther from the surface. In other areas the seasonal high water table is closer to the surface.

Included with this soil in mapping are small areas of the somewhat poorly drained Stronghurst soils. These

soils are in nearly level areas. They make up 1 to 5 percent of the unit.

Water and air move through the Sylvan soil at a moderate rate. Surface runoff is medium. Available water capacity is very high. Organic matter content is moderately low. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is moderately suited to cultivated crops and to dwellings. It is well suited to pasture and hay, to woodland, and to septic tank absorption fields. It is poorly suited to local roads and streets.

In areas used for corn, soybeans, or small grain, erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, contour farming, and stripcropping help to control erosion. Tillage when the soil is wet causes surface compaction and cloddiness and excessive runoff and erosion. Adding organic material minimizes crusting and improves tilth and fertility.

In areas used for pasture or hay, erosion is a hazard. Overgrazing reduces forage yields and causes surface compaction and excessive runoff and erosion. Timely deferment of grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and minimize erosion.

If this soil is used as a site for dwellings, the shrink-swell potential is a limitation. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for local roads and streets, low strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

The land capability classification is IIIe.

19D2—Sylvan silt loam, 10 to 18 percent slopes, eroded. This strongly sloping, well drained soil is on uplands. Individual areas range from 3 to 30 acres in size.

Typically, the surface layer is dark yellowish brown, friable silt loam about 8 inches thick. The subsoil is friable silt loam about 16 inches thick. The upper part is dark yellowish brown, and the lower part is yellowish brown. The underlying material to a depth of about 60 inches is brownish yellow and pale brown, mottled, very friable, calcareous silt. In some places the surface layer is thinner. In other places the calcareous underlying material is farther from the surface. In some areas the seasonal high water table is closer to the surface.

Included with this soil in mapping are small areas of the somewhat poorly drained Stronghurst soils. These soils are in nearly level areas. They make up 1 to 5 percent of the unit.

Water and air move through the Sylvan soil at a moderate rate. Surface runoff is rapid. Available water capacity is very high. Organic matter content is moderately low. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated or are used for pasture or hay. This soil is poorly suited to cultivated crops and to local roads and streets. It is moderately suited to pasture and hay, dwellings, and septic tank absorption fields. It is well suited to woodland.

In areas used for corn, soybeans, or small grain, erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, contour farming, and stripcropping help to control erosion. Tillage when the soil is wet causes surface compaction and cloddiness and excessive runoff and erosion. Adding organic material minimizes crusting and improves tilth and fertility.

In the areas used for pasture or hay, erosion is a hazard. Overgrazing reduces forage yields and causes surface compaction and excessive runoff and erosion. Timely deferment of grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and minimize erosion.

If this soil is used as a site for dwellings, the shrink-swell potential and the slope are limitations. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling. Cutting, filling, and land shaping help to overcome the slope.

If this soil is used as a site for septic tank absorption fields, the slope is a limitation. Installing the filter field lines on the contour and cutting, filling, and land shaping help to overcome this limitation.

If this soil is used as a site for local roads and streets, low strength, the potential for frost action, and the slope are limitations. Strengthening or replacing the base material and cutting, filling, and land shaping help to overcome these limitations.

The land capability classification is IIIe.

27C2—Miami silt loam, 5 to 10 percent slopes, eroded. This sloping, well drained soil is on uplands. Individual areas range from 3 to 25 acres in size.

Typically, the surface layer is dark grayish brown, friable silt loam about 6 inches thick. The subsoil is about 30 inches thick. It is yellowish brown. The upper part is friable clay loam; the next part is mottled, firm clay loam and loam; and the lower part is mottled, firm, calcareous loam. The underlying material to a depth of about 60 inches is yellowish brown, mottled, firm,

calcareous loam. In some places, the surface layer is thinner and free carbonates are closer to the surface. In other places the underlying material and free carbonates are farther from the surface.

Included with this soil in mapping are small areas of the moderately well drained Birkbeck soils. These soils formed in loess and in the underlying loam till. They are on side slopes above the Miami soil. They make up 5 to 10 percent of the unit.

Water and air move through the upper part of the Miami soil at a moderate rate and through the lower part at a moderately slow rate. Surface runoff is medium. Available water capacity is high. Organic matter content is moderately low. The shrink-swell potential and the potential for frost action are moderate.

Most areas are cultivated. This soil is moderately suited to cultivated crops and to dwellings. It is well suited to pasture and hay and to woodland. It is poorly suited to septic tank absorption fields and to local roads and streets.

In areas used for corn, soybeans, or small grain, erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, contour farming, and stripcropping help to control erosion. Tillage when the soil is wet causes surface compaction and cloddiness and excessive runoff and erosion. Adding organic material minimizes crusting and improves tilth and fertility.

In areas used for pasture or hay, erosion is a hazard. Overgrazing reduces forage yields and causes surface compaction and excessive runoff and erosion. Timely deferment of grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and minimize erosion.

If this soil is used as a site for dwellings, the shrink-swell potential is a limitation. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the restricted permeability is a limitation. Increasing the size of the filter field or replacing the soil with material that is more permeable helps to overcome this limitation.

If this soil is used as a site for local roads and streets, low strength is a limitation. Strengthening or replacing the base material helps to overcome this limitation.

The land capability classification is IIIe.

27D2—Miami silt loam, 10 to 15 percent slopes, eroded. This strongly sloping, well drained soil is on uplands. Individual areas range from 3 to 30 acres in size.

Typically, the surface layer is brown, friable silt loam about 7 inches thick. The subsoil is about 32 inches thick. It is yellowish brown. The upper part is friable silty clay loam, and the lower part is firm clay loam and loam. The underlying material to a depth of about 60 inches is yellowish brown, firm, calcareous loam. In some places, the surface layer is thinner and free carbonates are closer to the surface. In other places the underlying material and free carbonates are farther from the surface.

Included with this soil in mapping are small areas of the moderately well drained Birkbeck soils. These soils formed in loess and in the underlying loam till. They are on side slopes above the Miami soil. They make up 5 to 10 percent of the unit.

Water and air move through the upper part of the Miami soil at a moderate rate and through the lower part at a moderately slow rate. Surface runoff is rapid. Available water capacity is high. Organic matter content is moderately low. The shrink-swell potential and the potential for frost action are moderate.

Most areas are cultivated or are used for pasture or hay. This soil is poorly suited to cultivated crops, to pasture and hay, to septic tank absorption fields, and to local roads and streets. It is well suited to woodland. It is moderately suited to dwellings.

In areas used for corn, soybeans, or small grain, erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, contour farming, and stripcropping help to control erosion. Tillage when the soil is wet causes surface compaction and cloddiness and excessive runoff and erosion. Adding organic material minimizes crusting and improves tilth and fertility.

In the areas used for pasture or hay, erosion is a hazard. Overgrazing reduces forage yields and causes surface compaction and excessive runoff and erosion. Timely deferment of grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and minimize erosion.

If this soil is used as a site for dwellings, the slope and the shrink-swell potential are limitations. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling. Cutting, filling, and land shaping help to overcome the slope.

If this soil is used as a site for septic tank absorption fields, the restricted permeability and the slope are limitations. Increasing the size of the filter field or replacing the soil with material that is more permeable helps to overcome the restricted permeability. Installing the filter field lines on the contour and cutting, filling, and land shaping help to overcome the slope.

If this soil is used as a site for local roads and streets, low strength is a limitation. Strengthening or replacing the base material helps to overcome this limitation.

The land capability classification is IVe.

36B—Tama silt loam, 1 to 5 percent slopes. This gently sloping, moderately well drained soil is on uplands. Individual areas range from 3 to 500 acres in size.

Typically, the surface soil is very dark grayish brown, friable silt loam about 12 inches thick. The subsoil is about 43 inches thick. The upper part is brown and dark yellowish brown, friable and firm silty clay loam; the next part is dark yellowish brown, mottled, firm silty clay loam; and the lower part is yellowish brown, mottled, friable silt loam. The underlying material to a depth of about 60 inches also is yellowish brown, mottled, friable silt loam. In some places the surface soil is thinner. In other places depth to the seasonal high water table is less than 4 feet. In some areas the underlying material is calcareous loess or glacial till. In other areas it is stratified, loamy material. In places slopes are less than 1 percent.

Included with this soil in mapping are small areas of the somewhat poorly drained Stronghurst and poorly drained Sable soils. Sable soils are in shallow depressions and drainageways below the Tama soil. Stronghurst soils are in shallow depressions below the Tama soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Tama soil at a moderate rate. Surface runoff is medium. The seasonal high water table is 4 to 6 feet below the surface during the wettest periods of the year. Available water capacity is very high. Organic matter content is moderate. The shrink-swell potential also is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops and to pasture and hay. It is moderately suited to dwellings and septic tank absorption fields. It is poorly suited to local roads and streets.

In areas used for corn, soybeans, or small grain, erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, contour farming, and stripcropping help to control erosion. Tillage when the soil is wet causes surface compaction and cloddiness and excessive runoff and erosion. Adding organic material helps to maintain or improve tilth and fertility.

In areas used for pasture or hay, erosion is a hazard. Overgrazing reduces forage yields and causes surface compaction and excessive runoff and erosion. Timely deferment of grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and minimize erosion.

If this soil is used as a site for dwellings, the shrink-swell potential is a limitation. The seasonal high water table also is a limitation on sites for dwellings with basements. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling. Installing tile drains around the footings helps to lower the water table.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table is a limitation. Installing tile drains around the perimeter of the filter field helps to lower the water table.

If this soil is used as a site for local roads and streets, low strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

The land capability classification is IIe.

36C2—Tama silt loam, 5 to 10 percent slopes, eroded. This sloping, well drained soil is on uplands. Individual areas range from 3 to 160 acres in size.

Typically, the surface layer is mixed very dark grayish brown and brown, friable silt loam about 9 inches thick. The subsoil is about 43 inches thick. The upper part is dark yellowish brown, friable and firm silty clay loam; the next part is yellowish brown, firm silty clay loam; and the lower part is yellowish brown, friable silt loam. The underlying material to a depth of about 60 inches also is yellowish brown, friable silt loam. In places the surface layer is lighter colored. In some areas the underlying material is calcareous loam glacial till. In other areas slopes are less than 5 percent.

Included with this soil in mapping are small areas of the well drained Saybrook, somewhat poorly drained Ipava, and poorly drained Sable and Sawmill soils. Saybrook soils are on side slopes adjacent to the Tama soil. Ipava and Sable soils are lower on the landscape than the Tama soil. Sawmill soils are in drainageways below the Tama soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Tama soil at a moderate rate. Surface runoff is medium. Available water capacity is very high. Organic matter content is moderate. The shrink-swell potential also is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is moderately suited to cultivated crops. It is well suited to pasture and hay and to septic tank absorption fields. It is moderately suited to dwellings. It is poorly suited to local roads and streets.

In areas used for corn, soybeans, or small grain,

erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, contour farming, and stripcropping help to control erosion. Tillage when the soil is wet causes surface compaction and cloddiness and excessive runoff and erosion. Adding organic material helps to maintain or improve tilth and fertility.

In areas used for pasture or hay, erosion is a hazard. Overgrazing reduces forage yields and causes surface compaction and excessive runoff and erosion. Timely deferment of grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and minimize erosion.

If this soil is used as a site for dwellings, the shrink-swell potential is a limitation. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for local roads and streets, low strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

The land capability classification is IIIe.

43—Ipava silt loam. This nearly level, somewhat poorly drained soil is on uplands. Individual areas range from 3 to 640 acres in size.

Typically, the surface soil is very dark gray, friable silt loam about 18 inches thick. The subsoil is friable silty clay loam about 33 inches thick. The upper part is dark grayish brown, the next part is dark grayish brown and mottled, and the lower part is light olive brown and mottled. The underlying material to a depth of about 60 inches is light olive brown, mottled, friable silt loam. In some places the surface soil is thinner or lighter colored. In other places depth to the seasonal high water table is less than 1 foot or more than 3 feet. In some areas the underlying material contains more sand.

Included with this soil in mapping are small areas of the well drained Broadwell, moderately well drained Birkbeck, and poorly drained Denny soils. Broadwell soils are underlain by sand. They are on slight rises above the Ipava soil. Birkbeck soils are underlain by glacial till. They are on side slopes adjacent to the Ipava soil. Denny soils are in shallow depressions below the Ipava soil. Included soils make up 2 to 4 percent of the unit.

Water and air move through the Ipava soil at a moderately slow rate. Surface runoff is slow. The seasonal high water table is 1 to 3 feet below the surface during the wettest periods of the year. Available water capacity is very high. Organic matter content is high. The shrink-swell potential and the potential for frost action also are high.

Most areas are cultivated. This soil is well suited to cultivated crops and to pasture and hay. It is poorly suited to dwellings, septic tank absorption fields, and local roads and streets.

In areas used for corn, soybeans, or small grain, the seasonal high water table is a limitation. The wetness delays planting or interferes with harvesting in some years. Subsurface tile drains function satisfactorily if suitable outlets are available. Measures that maintain the drainage system are needed. Tillage when the soil is wet causes surface compaction and cloddiness. Adding organic material helps to maintain or improve tilth and fertility.

If this soil is used as a site for dwellings, the seasonal high water table and the shrink-swell potential are limitations. Installing tile drains around the footings helps to lower the water table. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the restricted permeability and the seasonal high water table are limitations. Increasing the size of the filter field or replacing the soil with material that is more permeable helps to overcome the restricted permeability. Installing tile drains around the perimeter of the filter field increases the depth to the water table. Grading and land shaping help to divert surface water from the filter field.

If this soil is used as a site for local roads and streets, low strength, the potential for frost action, and the shrink-swell potential are limitations. Strengthening or replacing the base material helps to overcome these limitations.

The land capability classification is I.

45—Denny silt loam. This nearly level, poorly drained soil is on uplands. It is ponded for brief periods from March through June. Individual areas range from 3 to 25 acres in size.

Typically, the surface layer is very dark gray, friable silt loam about 9 inches thick. The subsurface layer is light brownish gray, friable silt loam about 8 inches thick. The subsoil extends to a depth of about 60 inches. It is mottled and firm. The upper part is dark gray silty clay loam and silty clay, the next part is grayish brown silty clay loam, and the lower part is light olive gray silty clay loam. In some areas the soil has no subsurface layer and has a thicker surface soil.

Included with this soil in mapping are small areas of the moderately well drained Tama and somewhat poorly drained Ipava soils. These soils are on slight rises above the Denny soil. They make up 2 to 10 percent of the unit.

Water and air move through the Denny soil at a slow rate. Surface runoff is slow to ponded. The seasonal high water table is 1 foot above to 2 feet below the surface during the wettest periods of the year. Available water capacity is high. Organic matter content is moderate. The shrink-swell potential and the potential for frost action are high.

Most areas are cultivated. This soil is moderately suited to cultivated crops. It is generally unsuited to dwellings and septic tank absorption fields because of the ponding. It is poorly suited to local roads and streets.

In areas used for corn, soybeans, or small grain, the ponding is a hazard and the seasonal high water table is a limitation. The wetness delays planting or interferes with harvesting in many years. Surface ditches, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available. The wetness of this soil has been sufficiently reduced by a drainage system for production of the crops commonly grown in the county. Measures that maintain or improve the drainage system are needed. Tillage when the soil is wet causes surface compaction and cloddiness. Adding organic material helps to maintain or improve tilth and fertility.

If this soil is used as a site for local roads and streets, low strength, the potential for frost action, and the shrink-swell potential are limitations. Strengthening or replacing the base material helps to overcome these limitations.

The land capability classification is IIIw.

54B—Plainfield sand, 3 to 7 percent slopes. This gently sloping, excessively drained soil is on terraces. Individual areas range from 3 to 300 acres in size.

Typically, the surface layer is brown, very friable sand about 9 inches thick. The subsoil is yellowish brown sand about 16 inches thick. It is very friable in the upper part and loose in the lower part. The underlying material to a depth of about 60 inches is yellowish brown, loose sand. In some areas the surface layer is darker. In some places the subsoil contains more clay. In other places the soil has lamellae below a depth of 30 inches.

Included with this soil in mapping are small areas of the well drained Dakota, somewhat excessively drained Disco, and poorly drained Orio soils. Dakota and Disco soils are in the lower, more nearly level areas below the Plainfield soil. Orio soils are in shallow depressions and drainageways below the Plainfield soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Plainfield soil at a rapid rate. Surface runoff is very slow. Available water capacity is low. Organic matter content also is low.

Most areas are cultivated. This soil is poorly suited to cultivated crops unless it is irrigated. It is poorly suited to pasture and hay and to septic tank absorption fields. It is moderately suited to woodland. It is well suited to dwellings and to local roads and streets. The soil is a probable source of sand.

In areas used for corn, soybeans, or small grain, erosion and soil blowing are hazards and the low available water capacity is a limitation. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, contour farming, and stripcropping help to control erosion. Conservation tillage and field windbreaks help to control soil blowing and conserve moisture. Irrigation can help to compensate for the low available water capacity. Adding organic material increases the available water capacity and improves fertility.

In areas used for pasture or hay, the low available water capacity is a limitation and erosion and soil blowing are hazards. Overgrazing reduces forage yields and causes surface compaction and excessive runoff and erosion. Timely deferment of grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and minimize erosion. Bare spots, thin stands of plants, and recently planted areas are subject to soil blowing. Maintaining a thick, healthy plant cover minimizes soil blowing. Planting drought-resistant grasses and legumes helps to establish a plant cover.

In areas used as woodland, the low available water capacity is a limitation. Planting in furrows, mulching, and selecting seedlings that can withstand dry conditions reduce the seedling mortality rate and help to control plant competition.

If this soil is used as a site for septic tank absorption fields, a poor filtering capacity can result in pollution of the ground water by the effluent. Replacing the soil with several feet of suitable loamy material improves the filtering capacity. An alternative is a system that includes a sealed sand filter and a disinfection tank.

The land capability classification is IVs.

54D—Plainfield sand, 7 to 18 percent slopes. This strongly sloping, excessively drained soil is on terraces. Individual areas range from 3 to 520 acres in size.

Typically, the surface layer is dark brown, very friable sand about 5 inches thick. The subsoil is brown, very friable sand about 27 inches thick. The underlying material to a depth of about 60 inches is dark yellowish brown, loose sand. In some areas the surface soil is darker and thicker. In some places the subsoil has more clay. In other places the soil has lamellae below a depth of 30 inches.

Included with this soil in mapping are small areas of the well drained Dakota, somewhat excessively drained Disco, and poorly drained Orio soils. Dakota soils are in the lower, more nearly level areas below the Plainfield soil. Disco soils are on side slopes and in depressions below the Plainfield soil. Orio soils are in shallow depressions and drainageways below the Plainfield soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Plainfield soil at a rapid rate. Surface runoff is slow. Available water capacity is low. Organic matter content also is low.

Most areas are cultivated. This soil is generally unsuited to row crops because of the low available water capacity. It is poorly suited to small grain, to pasture and hay, and to septic tank absorption fields. It is moderately suited to woodland, dwellings, and local roads and streets. The soil is a probable source of sand.

In areas used for small grain, erosion and soil blowing are hazards and the low available water capacity is a limitation. A conservation tillage system that leaves crop residue on the surface and field windbreaks help to control erosion and soil blowing and conserve moisture. Irrigation can help to compensate for the low available water capacity. Adding organic material increases the available water capacity and improves fertility.

In areas used for pasture or hay, erosion and soil blowing are hazards and the low available water capacity is a limitation. Overgrazing reduces forage yields and causes surface compaction and excessive runoff and erosion. Timely deferment of grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and minimize erosion. Bare spots, thin stands of plants, and recently planted areas are subject to soil blowing. Maintaining a thick, healthy plant cover minimizes soil blowing. Planting drought-resistant grasses and legumes helps to establish a plant cover. Irrigation helps to maintain the quality of the plants.

In areas used as woodland, the low available water capacity is a limitation. Planting in furrows, mulching, and selecting seedlings that can withstand dry conditions reduce the seedling mortality rate and help to control plant competition.

If this soil is used as a site for dwellings, the slope is a limitation. Cutting, filling, and land shaping help to overcome this limitation.

If this soil is used as a site for septic tank absorption fields, a poor filtering capacity can result in pollution of the ground water by the effluent. Replacing the soil with several feet of suitable loamy material improves the filtering capacity. An alternative is a system that includes a sealed sand filter and a disinfection tank.

If this soil is used as a site for local roads and streets, the slope is a limitation. Cutting, filling, and land shaping help to overcome this limitation.

The land capability classification is VIs.

54F—Plainfield loamy sand, 18 to 45 percent slopes. This steep, excessively drained soil is on terraces. Individual areas range from 5 to 10 acres in size.

Typically, the surface layer is very dark grayish brown, loose loamy sand about 4 inches thick. The subsoil is very friable sand about 16 inches thick. The upper part is dark yellowish brown, and the lower part is yellowish brown. The underlying material to a depth of about 60 inches is yellowish brown, loose sand. In some areas the surface soil is darker and thicker. In some places slopes are less than 18 percent. In other places the soil has lamellae below a depth of 30 inches.

Included with this soil in mapping are small areas of the somewhat excessively drained Disco, well drained Onarga, and excessively drained Rodman soils. Disco soils are in nearly level areas below the Plainfield soil. Onarga soils are on side slopes below the Plainfield soil. Rodman soils are in landscape positions similar to those of the Plainfield soil. They have calcareous gravel. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Plainfield soil at a rapid rate. Surface runoff is medium. Available water capacity is low. Organic matter content also is low.

Most areas are wooded. This soil is moderately suited to woodland. It is poorly suited to local roads and streets. It is generally unsuited to cultivated crops and to dwellings because of the slope and to septic tank absorption fields because of a poor filtering capacity and the slope. The soil is a probable source of sand.

In the areas used as woodland, erosion is a hazard and the slope and the low available water capacity are limitations. Building logging roads and skid trails on or nearly on the contour and diverting surface water help to control erosion. Limiting logging activities to periods when the soil is dry or frozen helps to prevent excessive rutting and erosion. Seeding all bare areas to grasses or a grass-legume mixture after logging has been completed helps to control erosion. In the steepest areas the logs should be skidded uphill with a cable and winch. Planting in furrows, mulching, and selecting seedlings that can withstand dry conditions reduce the seedling mortality rate and help to control plant competition.

If this soil is used as a site for local roads and

streets, the slope is a limitation. Cutting, filling, and land shaping help to overcome this limitation.

The land capability classification is VIIs.

61—Atterberry silt loam. This nearly level, somewhat poorly drained soil is on uplands. Individual areas range from 3 to 45 acres in size.

Typically, the surface layer is very dark gray, friable silt loam about 8 inches thick. The subsurface layer is grayish brown, friable silt loam about 3 inches thick. The subsoil is about 41 inches thick. The upper part is grayish brown and brown, mottled, firm silty clay loam; the next part is olive gray and yellowish brown, mottled, firm silty clay loam; and the lower part is yellowish brown and olive gray, mottled, firm and friable silt loam. The underlying material to a depth of about 60 inches is brownish yellow and light olive gray, mottled, friable silt loam. In some places the surface layer is lighter colored. In other places the surface soil is thicker. In places depth to the seasonal high water table is less than 1 foot or more than 3 feet.

Included with this soil in mapping are small areas of the moderately well drained Rozetta soils. These soils are higher on the landscape than the Atterberry soil. They make up 2 to 5 percent of the unit.

Water and air move through the Atterberry soil at a moderate rate. Surface runoff is slow. The seasonal high water table is 1 to 3 feet below the surface during the wettest periods of the year. Available water capacity is very high. Organic matter content is moderate. The shrink-swell potential also is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, and to woodland. It is poorly suited to dwellings, septic tank absorption fields, and local roads and streets.

In areas used for corn, soybeans, or small grain, the seasonal high water table is a limitation. The wetness delays planting or interferes with harvesting in some years. Subsurface tile drains function satisfactorily if suitable outlets are available. Measures that maintain the drainage system are needed. Tillage when the soil is wet causes surface compaction and cloddiness. Adding organic material helps to maintain or improve tilth and fertility.

If this soil is used as a site for dwellings, the seasonal high water table is a limitation. Installing tile drains around the footings helps to lower the water table.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table is a limitation. Installing tile drains around the perimeter of the filter field increases the depth to the water table. Grading and land shaping help to divert surface water from the filter field.

If this soil is used as a site for local roads and streets, low strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

The land capability classification is I.

67—Harpster silty clay loam. This nearly level, poorly drained soil is on uplands. It is ponded for brief periods from February through April. Individual areas range from 3 to 700 acres in size.

Typically, the surface soil is black, calcareous, firm silty clay loam about 12 inches thick. The subsoil is about 30 inches thick. The upper part is dark gray and grayish brown, mottled, firm, calcareous silty clay loam, and the lower part is light brownish gray, mottled, friable, calcareous silt loam. The underlying material to a depth of about 60 inches is gray, mottled, friable, calcareous silt loam. In some places the surface soil is thicker. In other places the subsoil contains more sand. In some areas the soil is not calcareous within a depth of 40 inches. In other areas the underlying material is farther from the surface.

Included with this soil in mapping are small areas of the somewhat poorly drained Ipava, well drained Plano, and moderately well drained Tama soils. These soils do not have carbonates within a depth of 40 inches. They are on slight rises above the Harpster soil. They make up 1 to 7 percent of the unit.

Water and air move through the Harpster soil at a moderate rate. Surface runoff is slow to ponded. The seasonal high water table is 0.5 foot above to 2.0 feet below the surface during the wettest periods of the year. Available water capacity is very high. Organic matter content is high. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops. It is generally unsuited to dwellings and septic tank absorption fields because of the ponding. It is poorly suited to local roads and streets.

In areas used for corn, soybeans, or small grain, the ponding is a hazard and the seasonal high water table is a limitation. The wetness delays planting or interferes with harvesting in many years. Surface ditches, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available. The wetness of this soil has been sufficiently reduced by a drainage system for production of the crops commonly grown in the county. Measures that maintain or improve the drainage system are needed. Tillage when the soil is wet causes surface compaction and cloddiness. Adding organic material helps to maintain or improve tilth and fertility.

If this soil is used as a site for local roads and streets, low strength, the seasonal high water table, and the potential for frost action are limitations and the ponding is a hazard. Strengthening or replacing the base material helps to prevent the damage caused by low strength and frost action. Constructing open ditches, which remove excess water, and raising the roadbed with suitable fill material reduce the wetness and the hazard of ponding.

The land capability classification is IIw.

68—Sable silty clay loam. This nearly level, poorly drained soil is on uplands. It is ponded for brief periods in March and April. Individual areas range from 3 to 1,625 acres in size.

Typically, the surface layer is black, firm silty clay loam about 8 inches thick. The subsurface layer also is black, firm silty clay loam. It is about 7 inches thick. The subsoil extends to a depth of about 60 inches. It is mottled and firm. The upper part is dark gray and dark grayish brown silty clay loam, the next part is grayish brown silty clay loam, and the lower part is grayish brown silt loam. In some places the surface soil is thicker. In other places the underlying material contains more sand and is calcareous. In some areas depth to the seasonal high water table is more than 2 feet.

Included with this soil in mapping are small areas of the well drained Plano and moderately well drained Tama soils. These soils are on knobs and slight rises above the Sable soil. They make up 2 to 5 percent of the unit.

Water and air move through the Sable soil at a moderate rate. Surface runoff is slow to ponded. The seasonal high water table is 0.5 foot above to 2.0 feet below the surface during the wettest periods of the year. Available water capacity is very high. Organic matter content is high. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops. It is generally unsuited to dwellings and septic tank absorption fields because of the ponding. It is poorly suited to local roads and streets.

In areas used for corn, soybeans, or small grain, the ponding is a hazard and the seasonal high water table is a limitation. The wetness delays planting or interferes with harvesting in many years. Surface ditches, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available. The wetness of this soil has been sufficiently reduced by a drainage system for production of the crops commonly grown in the county. Measures that maintain or improve the drainage system are needed. Tillage when the soil is wet causes surface compaction and cloddiness. Adding organic material helps to maintain or improve tilth and fertility.

If this soil is used as a site for local roads and streets, low strength, the potential for frost action, and the seasonal high water table are limitations and the ponding is a hazard. Strengthening or replacing the base material helps to prevent the damage caused by low strength and frost action. Constructing open ditches, which remove excess water, and raising the roadbed with suitable fill material reduce the wetness and the hazard of ponding.

The land capability classification is IIw.

88B—Sparta loamy sand, 1 to 7 percent slopes. This gently sloping, excessively drained soil is on terraces. Individual areas range from 3 to 75 acres in size.

Typically, the surface layer is very dark brown, very friable loamy sand about 10 inches thick. The subsurface layer is very dark grayish brown, very friable sand about 8 inches thick. The subsoil is very friable sand about 19 inches thick. The upper part is dark yellowish brown, and the lower part is yellowish brown. The underlying material to a depth of about 60 inches is yellowish brown, loose sand. In some places the subsurface layer is thicker. In other places the surface layer is lighter colored. In some areas the subsoil has more clay. In other areas the underlying material contains gravel.

Included with this soil in mapping are small areas of the well drained Dakota and Jasper and poorly drained Orio soils. Dakota and Jasper soils contain more clay than the Sparta soil. They are on the lower parts of the landscape. Orio soils are in shallow depressions. Included soils make up 2 to 5 percent of the unit.

Water and air move through the Sparta soil at a rapid rate. Surface runoff is very slow. Available water capacity is low. Organic matter content is moderately low.

Most areas are cultivated. This soil is poorly suited to cultivated crops unless it is irrigated. It is poorly suited to pasture and hay and to septic tank absorption fields. It is well suited to dwellings and to local roads and streets. The soil is a probable source of sand.

In areas used for corn, soybeans, or small grain, erosion and soil blowing are hazards and the low available water capacity is a limitation. A conservation tillage system that leaves crop residue on the surface and field windbreaks help to control erosion and soil blowing and conserve moisture. Irrigation can help to compensate for the low available water capacity. Adding organic material increases the available water capacity and improves fertility.

In areas used for pasture or hay, erosion and soil

blowing are hazards and the low available water capacity is a limitation. Overgrazing reduces forage yields and causes surface compaction and excessive runoff and erosion. Timely deferment of grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and minimize erosion. Bare spots, thin stands of plants, and recently planted areas are subject to soil blowing. Maintaining a thick, healthy plant cover minimizes soil blowing. Planting drought-resistant grasses and legumes helps to establish a plant cover. Irrigation helps to maintain the quality of the plants.

In areas used as woodland, droughtiness is a limitation. Planting in furrows, mulching, and selecting seedlings that can withstand dry conditions reduce the seedling mortality rate and help to control plant competition.

If this soil is used as a site for septic tank absorption fields, a poor filtering capacity can result in pollution of the ground water by the effluent. Replacing the soil with several feet of suitable loamy material improves the filtering capacity. An alternative is a system that includes a sealed sand filter and a disinfection tank.

The land capability classification is IVs.

88D—Sparta loamy sand, 7 to 15 percent slopes. This strongly sloping, excessively drained soil is on terraces. Individual areas range from 3 to 60 acres in size.

Typically, the surface layer is very dark grayish brown, very friable loamy sand about 8 inches thick. The subsurface layer is very dark brown and dark brown, very friable loamy sand about 27 inches thick. The subsoil is dark yellowish brown, very friable loamy sand about 10 inches thick. The underlying material to a depth of about 60 inches is dark yellowish brown, loose sand. In some places the surface soil is thinner. In other places it is lighter colored. In some areas the subsoil contains more clay. In other areas the soil has lamellae below a depth of 30 inches. In places it contains more sand.

Included with this soil in mapping are small areas of the well drained Dakota and Jasper and somewhat excessively drained Disco soils. These soils contain more clay than the Sparta soil. They are on the lower parts of the landscape. They make up 2 to 10 percent of the unit.

Water and air move through the Sparta soil at a rapid rate. Surface runoff is slow. Available water capacity is low. Organic matter content is moderately low.

Most areas are cultivated. This soil is generally unsuited to row crops because of the low available water capacity. It is poorly suited to small grain, to pasture and hay, and to septic tank absorption fields. It is moderately suited to dwellings, woodland, and local roads and streets. The soil is a probable source of sand.

In areas used for small grain, erosion and soil blowing are hazards and the low available water capacity is a limitation. A conservation tillage system that leaves crop residue on the surface and field windbreaks help to control erosion and soil blowing and conserve moisture. Irrigation can help to compensate for the low available water capacity. Adding organic material increases the available water capacity and improves fertility.

In areas used for pasture or hay, erosion and soil blowing are hazards and the low available water capacity is a limitation. Overgrazing reduces forage yields and causes surface compaction and excessive runoff and erosion. Timely deferment of grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and minimize erosion. Bare spots, thin stands of plants, and recently planted areas are subject to soil blowing. Maintaining a thick, healthy plant cover minimizes soil blowing. Planting drought-resistant grasses and legumes helps to establish a plant cover. Irrigation helps to maintain the quality of the plants.

In areas used as woodland, the low available water capacity is a limitation. Planting in furrows, mulching, and selecting seedlings that can withstand dry conditions reduce the seedling mortality rate and help to control plant competition.

If this soil is used as a site for dwellings, the slope is a limitation. Cutting, filling, and land shaping help to overcome this limitation.

If this soil is used as a site for septic tank absorption fields, a poor filtering capacity can result in pollution of the ground water by the effluent. Replacing the soil with several feet of suitable loamy material improves the filtering capacity. An alternative is a system that includes a sealed sand filter and a disinfection tank.

If this soil is used as a site for local roads and streets, the slope is a limitation. Cutting, filling, and land shaping help to overcome this limitation.

The land capability classification is VIs.

93D—Rodman gravelly loam, 7 to 18 percent slopes. This strongly sloping, excessively drained soil is on terraces. Individual areas range from 5 to 15 acres in size.

Typically, the surface layer is very dark grayish brown, very friable gravelly loam about 7 inches thick. The subsoil is dark brown, very friable gravelly loam about 4 inches thick. The underlying material to a depth of about 60 inches is brown, loose, calcareous,

stratified sand and gravel. In places the underlying material is farther from the surface.

Included with this soil in mapping are small areas of the well drained St. Charles soils. These soils are on slopes above the Rodman soil. They contain more clay and silt and less gravel than the Rodman soil. They make up 2 to 5 percent of the unit.

Water and air move through the upper part of the Rodman soil at a moderately rapid rate and through the lower part at a very rapid rate. Surface runoff is medium. Available water capacity is very low. Organic matter content is moderate.

Most areas are pastured or wooded. This soil is generally unsuited to cultivated crops because of the very low available water capacity. It is poorly suited to pasture and hay, to woodland, and to septic tank absorption fields. It is moderately suited to dwellings and to local roads and streets.

In the areas used for pasture or hay, erosion is a hazard and the very low available water capacity is a limitation. Overgrazing reduces forage yields and causes surface compaction and excessive runoff and erosion. Timely deferment of grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and minimize erosion. Planting drought-resistant grasses and legumes helps to establish a plant cover. Irrigation helps to maintain the quality of the plants.

In the areas used as woodland, the very low available water capacity is a limitation. Planting in furrows, mulching, and selecting seedlings that can withstand dry conditions reduce the seedling mortality rate and help to control plant competition.

If this soil is used as a site for dwellings, the slope is a limitation. Cutting, filling, and land shaping help to overcome this limitation.

If this soil is used as a site for septic tank absorption fields, a poor filtering capacity can result in pollution of the ground water by the effluent. Replacing the soil with several feet of suitable loamy material improves the filtering capacity. An alternative is a system that includes a sealed sand filter and a disinfection tank.

If this soil is used as a site for local roads and streets, the slope is a limitation. Cutting, filling, and land shaping help to overcome this limitation.

The land capability classification is IVs.

93F—Rodman gravelly loam, 18 to 40 percent slopes. This steep, excessively drained soil is on terraces. Individual areas range from 5 to 40 acres in size.

Typically, the surface layer is very dark grayish brown, friable gravelly loam about 8 inches thick. The subsoil is dark brown, very friable very gravelly loam about 6 inches thick. The underlying material to a depth of about 60 inches is brown, loose, calcareous sand and gravel. In places the underlying material is farther from the surface.

Included with this soil in mapping are small areas of the well drained St. Charles and Camden soils. These soils contain more clay and silt and less gravel than the Rodman soil. They are on the higher parts of the landscape. They make up 2 to 5 percent of the unit.

Water and air move through the upper part of the Rodman soil at a moderately rapid rate and through the lower part at a very rapid rate. Surface runoff is medium. Available water capacity is very low. Organic matter content is moderate.

Most areas are wooded. This soil is moderately suited to woodland. It is generally unsuited to pasture and hay, cultivated crops, and dwellings because of the slope and to septic tank absorption fields because of the slope and a poor filtering capacity. It is poorly suited to local roads and streets.

In the areas used as woodland, erosion is a hazard and the slope and the very low available water capacity are limitations. Building logging roads and skid trails on or nearly on the contour and diverting surface water help to control erosion. Limiting logging activities to periods when the soil is dry or frozen helps to prevent excessive rutting and erosion. Seeding all bare areas to grasses or a grass-legume mixture after logging has been completed helps to control erosion. In the steepest areas the logs should be skidded uphill with a cable and winch. Planting in furrows, mulching, and selecting seedlings that can withstand dry conditions reduce the seedling mortality rate and help to control plant competition.

If this soil is used as a site for local roads and streets, the slope is a limitation. Cutting, filling, and land shaping help to overcome this limitation.

The land capability classification is VIIs.

100—Palms muck. This nearly level, very poorly drained soil is on terraces. It is ponded for long periods from November through May. Individual areas range from 15 to 95 acres in size.

Typically, the surface soil is black and very dark grayish brown, very friable muck about 27 inches thick. The underlying material to a depth of about 60 inches is grayish brown and light gray, mottled, friable and very friable, stratified silt loam, loam, and sandy loam. In some places the layer of muck is thinner. In other places the soil is calcareous near the surface. In some areas the surface soil contains more sand. In other areas it is silt loam. In places the muck extends to a depth of more than 60 inches.

Included with this soil in mapping are small areas of

the poorly drained Selma soils. These soils formed in loamy material. They are on the slightly higher parts of the landscape. They make up 5 to 10 percent of the unit.

Water and air move through the Palms soil at a moderately slow rate. Surface runoff is very slow or ponded. The seasonal high water table is 1 foot above to 1 foot below the surface during the wettest periods of the year. Available water capacity is very high. Organic matter content also is very high. The potential for frost action is high.

Most areas are cultivated. Some support prairie or wetland grasses. This soil is moderately suited to cultivated crops. It is poorly suited to woodland. It is generally unsuited to dwellings, septic tank absorption fields, and local roads and streets because of subsidence and ponding.

In areas used for corn, soybeans, or small grain, ponding, soil blowing, and subsidence are hazards. The wetness delays planting or interferes with harvesting in many years. Surface ditches, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available. The wetness of this soil has been sufficiently reduced by a drainage system for production of the crops commonly grown in the county. Measures that maintain or improve the drainage system are needed. Preventing dehydration of the subsoil by ceasing drainage during dry periods minimizes subsidence. A conservation tillage system that leaves crop residue on the surface and field windbreaks help to control soil blowing.

In areas used as woodland, the wetness is a limitation. Ponding, flooding, and the seasonal high water table restrict accessibility by equipment. Using machinery only when the soil is firm enough to support the equipment minimizes rutting and compaction. The wetness increases the seedling mortality rate. Properly preparing the site, selecting seedlings that can withstand wetness, and establishing drainageways to remove surface water reduce the seedling mortality rate and help to control plant competition.

The land capability classification is IIIw.

102—La Hogue loam. This nearly level, somewhat poorly drained soil is on terraces. Individual areas range from 5 to 170 acres in size.

Typically, the surface layer is very dark gray, firm loam about 7 inches thick. The subsurface layer is black and very dark gray, firm and friable loam about 15 inches thick. The subsoil is about 29 inches thick. The upper part is dark grayish brown and dark brown, mottled, firm clay loam; the next part is dark yellowish brown, mottled, firm sandy clay loam; and the lower part is brown, mottled, friable sandy loam. The underlying material to a depth of about 60 inches is stratified brown and dark brown, loose and very friable loamy sand, sandy loam, and sand. In some places the subsurface layer is thinner. In other places the surface soil contains more sand. In some areas the upper part of the subsoil has no gray mottles. In other areas the subsoil contains more clay. In places depth to the seasonal high water table is more than 3 feet.

Included with this soil in mapping are small areas of the well drained Dakota and Onarga and poorly drained Orio soils. Dakota and Onarga soils are on the higher parts of the landscape. Orio soils are on the lower parts of the landscape. Included soils make up 2 to 10 percent of the unit.

Water and air move through the upper part of the La Hogue soil at a moderate rate and through the lower part at a moderately rapid rate. Surface runoff is slow. The seasonal high water table is 1 to 3 feet below the surface during the wettest periods of the year. Available water capacity is high. Organic matter content is moderate. The shrink-swell potential also is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops and to pasture and hay. It is poorly suited to dwellings, septic tank absorption fields, and local roads and streets.

In areas used for corn, soybeans, or small grain, the seasonal high water table is a limitation. The wetness delays planting or interferes with harvesting in some years. Subsurface tile drains function satisfactorily if suitable outlets are available. Measures that maintain the drainage system are needed. Tillage when the soil is wet causes surface compaction and cloddiness. Adding organic material helps to maintain or improve tilth and fertility.

If this soil is used as a site for dwellings, the seasonal high water table is a limitation. Installing tile drains around the footings helps to lower the water table.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table is a limitation. Installing tile drains around the perimeter of the filter field increases the depth to the water table. Grading and land shaping help to divert surface water from the filter field.

If this soil is used as a site for local roads and streets, low strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

The land capability classification is I.

103—Houghton muck. This nearly level, very poorly drained soil is on terraces and flood plains. It is ponded for long periods from November through May. Individual

areas range from 3 to 70 acres in size.

Typically, the upper part of this soil is black muck about 10 inches thick. The lower part to a depth of about 60 inches is dark reddish brown muck. In some places the underlying material has more sand. In other places it has more clay. In some areas the soil is calcareous. In other areas the depth to mineral material is less than 51 inches.

Included with this soil in mapping are small areas of the poorly drained, mineral Selma soils. These soils are on the slightly higher parts of the landscape. They make up 5 to 10 percent of the unit.

Water and air move through the Houghton soil at a moderate rate. Surface runoff is very slow or ponded. The seasonal high water table is 1 foot above to 1 foot below the surface during the wettest periods of the year. Available water capacity is very high. Organic matter content also is very high. The potential for frost action is high.

Most areas are cultivated. Some support prairie or wetland grasses. This soil is moderately suited to cultivated crops. It is poorly suited to woodland. It is generally unsuited to dwellings, septic tank absorption fields, and local roads and streets because of subsidence and ponding.

In areas used for corn, soybeans, or small grain, ponding, subsidence, and soil blowing are hazards and the seasonal high water table is a limitation. The wetness delays planting or interferes with harvesting in many years. Surface ditches, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available. The wetness of this soil has been sufficiently reduced by a drainage system for production of the crops commonly grown in the county. Measures that maintain or improve the drainage system are needed. Preventing dehydration of the subsoil by ceasing drainage during dry periods minimizes subsidence. A conservation tillage system that leaves crop residue on the surface and field windbreaks help to control soil blowing.

In areas used as woodland, the wetness is a limitation. Ponding, flooding, and the seasonal high water table restrict accessibility by equipment. Using machinery only when the soil is firm enough to support the equipment minimizes rutting and compaction. The wetness increases the seedling mortality rate. Properly preparing the site, selecting seedlings that can withstand wetness, and establishing drainageways to remove surface water reduce the seedling mortality rate and help to control plant competition.

The land capability classification is IIIw.

125—Selma loam. This nearly level, poorly drained soil is on terraces. It is ponded for brief periods from March through May. Individual areas range from 5 to 320 acres in size.

Typically, the surface layer is black, friable loam about 9 inches thick. The subsurface layer is very dark gray, friable loam about 13 inches thick. The subsoil is mottled, friable loam about 28 inches thick. The upper part is dark gray, and the lower part is gray. The underlying material to a depth of about 60 inches is light olive gray, mottled, friable silt loam and loam. In some places the subsurface layer is thicker. In other places the surface layer is calcareous. In some areas the soil contains less sand. In other areas the underlying material is within a depth of 35 inches and contains gravel. In places depth to the seasonal high water table is more than 3 feet.

Included with this soil in mapping are small areas of the poorly drained Harpster and Orio soils. Harpster soils formed in calcareous, silty material. They are in landscape positions similar to those of the Selma soil. Orio soils have sandy underlying material at a depth of about 35 inches and have a gray subsurface layer. They are on the slightly lower parts of the landscape. Included soils make up 5 to 10 percent of the unit.

Water and air move through the Selma soil at a moderate rate. Surface runoff is slow to ponded. The seasonal high water table is 0.5 foot above to 2.0 feet below the surface during the wettest periods of the year. Available water capacity is high. Organic matter content also is high. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops. It is generally unsuited to dwellings and septic tank absorption fields because of the ponding. It is poorly suited to local roads and streets.

In areas used for corn, soybeans, or small grain, the ponding is a hazard and the seasonal high water table is a limitation. The wetness delays planting or interferes with harvesting in many years. Surface ditches, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available. The wetness of this soil has been sufficiently reduced by a drainage system for production of the crops commonly grown in the county. Measures that maintain or improve the drainage system are needed. Tillage when the soil is wet causes surface compaction and cloddiness. Adding organic material helps to maintain or improve tilth and fertility.

If this soil is used as a site for local roads and streets, the potential for frost action is a limitation and the ponding is a hazard. Strengthening or replacing the base material reduces the potential for frost action. Constructing open ditches, which remove excess water,

and raising the roadbed with suitable fill material reduce the hazard of ponding.

The land capability classification is IIw.

131A—Alvin loamy sand, 0 to 3 percent slopes. This nearly level, well drained soil is on terraces. Individual areas range from 3 to 50 acres in size.

Typically, the surface layer is brown, very friable loamy sand about 8 inches thick. The subsoil extends to a depth of about 60 inches. The upper part is brown, very friable and friable sandy loam, and the lower part is strong brown, loose sand that has lamellae of strong brown, very friable loamy sand. In some places the surface soil is thicker. In other places the surface layer is darker. In some areas the subsoil contains less clay.

Included with this soil in mapping are small areas of the excessively drained Coloma, Plainfield, and Sparta soils. These soils contain more sand and less clay than the Alvin soil. They are on the higher parts of the landscape. They make up 2 to 10 percent of the unit.

Water and air move through the Alvin soil at a moderately rapidly rate. Surface runoff is slow. Available water capacity is moderate. Organic matter content is low. The potential for frost action is moderate.

Most areas are cultivated. This soil is moderately suited to cultivated crops, to pasture and hay, and to local roads and streets. It is well suited to woodland, dwellings, and septic tank absorption fields. The soil is a probable source of sand.

In areas used for corn, soybeans, or small grain, soil blowing is a hazard and the moderate available water capacity is a limitation. A conservation tillage system that leaves crop residue on the surface and field windbreaks help to control soil blowing and conserve moisture. Irrigation can help to compensate for the moderate available water capacity. Adding organic material increases the available water capacity and improves fertility.

In areas used for pasture or hay, soil blowing is a hazard and the moderate available water capacity is a limitation. Bare spots, thin stands of plants, and recently planted areas are subject to soil blowing. Maintaining a thick, healthy plant cover minimizes soil blowing. Planting drought-resistant grasses and legumes helps to establish a plant cover. Timely deferment of grazing, rotation grazing, applications of fertilizer, and irrigation help to maintain the quality of the plants.

In areas used as woodland, the moderate available water capacity is a limitation. Planting in furrows, mulching, and selecting seedlings that can withstand dry conditions reduce the seedling mortality rate and help to control plant competition.

If this soil is used as a site for local roads and streets, the potential for frost action is a limitation. Strengthening or replacing the base material helps to overcome this limitation.

The land capability classification is IIs.

131B—Alvin loamy sand, 3 to 7 percent slopes. This sloping, well drained soil is on terraces. Individual areas range from 3 to 35 acres in size.

Typically, the surface layer is dark brown, very friable loamy sand about 8 inches thick. The subsoil extends to a depth of about 60 inches. The upper part is dark yellowish brown, very friable sandy loam; the next part is dark brown, very friable sandy loam; and the lower part is yellowish brown, loose sand that has lamellae of dark brown, very friable loamy sand. In some places the surface layer contains less sand and clay. In other places the surface soil is darker and thicker. In some areas the subsoil contains more clay.

Included with this soil in mapping are small areas of the excessively drained Coloma and Plainfield and well drained Jasper soils. Coloma and Plainfield soils contain more sand and less clay than the Alvin soil. They are on the higher parts of the landscape or are in landscape positions similar to those of the Alvin soil. Jasper soils contain more clay in the subsoil than the Alvin soil and have a darker surface layer. They are on the lower parts of the landscape. Included soils make up 5 to 15 percent of the unit.

Water and air move through the Alvin soil at a moderately rapid rate. Surface runoff is medium. Available water capacity is moderate. Organic matter content is low. The potential for frost action is moderate.

Most areas are cultivated. This soil is moderately suited to cultivated crops, to pasture and hay, and to local roads and streets. It is well suited to woodland, dwellings, and septic tank absorption fields. The soil is a probable source of sand.

In areas used for corn, soybeans, or small grain, erosion and soil blowing are hazards and the moderate available water capacity is a limitation. A conservation tillage system that leaves crop residue on the surface and field windbreaks help to control erosion and soil blowing and conserve moisture. Irrigation can help to compensate for the moderate available water capacity. Adding organic material increases the available water capacity and improves fertility.

In areas used for pasture or hay, erosion and soil blowing are hazards and the moderate available water capacity is a limitation. Overgrazing reduces forage yields and causes surface compaction and excessive runoff and erosion. Timely deferment of grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and minimize erosion.

Bare spots, thin stands of plants, and recently planted areas are subject to soil blowing. Maintaining a thick, healthy plant cover minimizes soil blowing. Planting drought-resistant grasses and legumes helps to establish a plant cover. Irrigation helps to maintain the quality of the plants.

In areas used as woodland, the moderate available water capacity is a limitation. Planting in furrows, mulching, and selecting seedlings that can withstand dry conditions reduce the seedling mortality rate and help to control plant competition.

If this soil is used as a site for local roads and streets, the potential for frost action is a limitation. Strengthening or replacing the base material helps to overcome this limitation.

The land capability classification is IIIe.

131D—Alvin fine sandy loam, 7 to 12 percent slopes. This sloping, well drained soil is on terraces. Individual areas range from 3 to 35 acres in size.

Typically, the surface layer is brown, very friable fine sandy loam about 7 inches thick. The subsurface layer is dark yellowish brown, very friable fine sandy loam about 7 inches thick. The subsoil is about 40 inches thick. It is dark yellowish brown. The upper part is friable loam, and the lower part is very friable fine sandy loam. The underlying material extends to a depth of more than 60 inches. It is yellowish brown. The upper part is very friable loamy fine sand, and the lower part is loose loamy coarse sand and coarse sand. In some places the surface layer contains less sand and clay. In other places the surface soil is darker and thicker. In some areas the subsoil contains less clay.

Included with this soil in mapping are small areas of the well drained Fayette and excessively drained Plainfield soils. Fayette soils have less than 10 percent sand throughout. They are on the higher parts of the landscape. Plainfield soils are on side slopes on the higher parts of the landscape. Included soils make up 2 to 20 percent of the unit.

Water and air move through the Alvin soil at a moderately rapid rate. Surface runoff is medium. Available water capacity is moderate. Organic matter content is moderately low. The potential for frost action is moderate.

Most areas are cultivated. This soil is moderately suited to cultivated crops, to pasture and hay, and to local roads and streets. It is well suited to woodland, dwellings, and septic tank absorption fields. The soil is a probable source of sand.

In areas used for corn, soybeans, or small grain, erosion and soil blowing are hazards and the moderate available water capacity is a limitation. A conservation tillage system that leaves crop residue on the surface and field windbreaks help to control erosion and soil blowing and conserve moisture. Irrigation can help to compensate for the moderate available water capacity. Adding organic material increases the available water capacity and improves fertility.

In areas used for pasture or hay, erosion and soil blowing are hazards and the moderate available water capacity is a limitation. Overgrazing reduces forage yields and causes surface compaction and excessive runoff and erosion. Timely deferment of grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and minimize erosion. Bare spots, thin stands of plants, and recently planted areas are subject to soil blowing. Maintaining a thick, healthy plant cover minimizes soil blowing. Planting drought-resistant grasses and legumes helps to establish a plant cover. Irrigation helps to maintain the quality of the plants.

In areas used as woodland, the moderate available water capacity is a limitation. Planting in furrows, mulching, and selecting seedlings that can withstand dry conditions reduce the seedling mortality rate and help to control plant competition.

If this soil is used as a site for dwellings, the slope is a limitation. Cutting, filling, and land shaping help to overcome this limitation.

If this soil is used as a site for local roads and streets, the potential for frost action is a limitation. Strengthening or replacing the base material helps to overcome this limitation.

The land capability classification is IIIe.

134A—Camden silt loam, 0 to 2 percent slopes. This nearly level, well drained soil is on terraces. Individual areas range from 5 to 40 acres in size.

Typically, the surface soil is dark brown, friable silt loam about 9 inches thick. The subsurface layer also is dark brown, friable silt loam. It is about 7 inches thick. The subsoil is about 28 inches thick. It is yellowish brown and friable. The upper part is silty clay loam, and the lower part is stratified sandy clay loam and sandy loam. The underlying material to a depth of about 60 inches is dark yellowish brown, firm sandy clay loam and stratified loose loamy sand and very friable sandy loam. In some areas the stratified, loamy material is farther from the surface. In other areas the subsoil contains more sand.

Included with this soil in mapping are small areas of the well drained Huntsville and Ross and excessively drained Rodman soils. Huntsville and Ross soils are subject to flooding and are on flood plains. Rodman soils are on steep slope breaks adjacent to the Camden soil. Included soils make up 5 to 10 percent of the unit.

Water and air move through the upper part of the

Camden soil at a moderate rate and through the lower part at a moderate or moderately rapid rate. Surface runoff is slow. Available water capacity is high. Organic matter content is moderately low. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops, pasture and hay, woodland, and septic tank absorption fields. It is moderately suited to dwellings and poorly suited to local roads and streets.

No major limitations affect the use of this soil for corn, soybeans, or small grain. Tillage when the soil is wet causes surface compaction and cloddiness. Adding organic material minimizes crusting and improves tilth and fertility.

If this soil is used as a site for dwellings without basements, the shrink-swell potential is a limitation. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for local roads and streets, low strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

The land capability classification is I.

134B—Camden silt loam, 2 to 5 percent slopes. This gently sloping, well drained soil is on terraces. Individual areas range from 3 to 10 acres in size.

Typically, the surface layer is dark brown, friable silt loam about 8 inches thick. The subsurface layer is yellowish brown, friable silt loam about 4 inches thick. The subsoil is about 46 inches thick. It is dark yellowish brown. The upper part is firm and friable silty clay loam, and the lower part is friable loam. The underlying material to a depth of about 60 inches is brown, friable gravelly clay loam. In some places the stratified, loamy material is farther from the surface. In other places the subsoil contains sand and gravel. In some areas the surface layer is darker and thicker.

Included with this soil in mapping are small areas of the well drained Huntsville and Ross and excessively drained Rodman soils. Huntsville and Ross soils are subject to flooding and are on flood plains. Rodman soils are on steep slope breaks adjacent to the Camden soil. Included soils make up 5 to 10 percent of the unit.

Water and air move through the upper part of the Camden soil at a moderate rate and through the lower part at a moderate or moderately rapid rate. Surface runoff is medium. Available water capacity is high. Organic matter content is moderately low. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops, pasture and hay, woodland, and septic tank absorption fields. It is moderately suited to dwellings and poorly suited to local roads and streets.

In areas used for corn, soybeans, or small grain, erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, contour farming, and stripcropping help to control erosion. Tillage when the soil is wet causes surface compaction and cloddiness and excessive runoff and erosion. Adding organic material minimizes crusting and improves tilth and fertility.

In areas used for pasture or hay, erosion is a hazard. Overgrazing reduces forage yields and causes surface compaction and excessive runoff and erosion. Timely deferment of grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and minimize erosion.

If this soil is used as a site for dwellings without basements, the shrink-swell potential is a limitation. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

If this soil as a site for local roads and streets, low strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

The land capability classification is IIe.

138—Shiloh silty clay loam. This nearly level, poorly drained soil is on uplands and terraces. It is ponded for brief periods from March through May. Individual areas range from 3 to 520 acres in size.

Typically, the surface layer is black, firm silty clay loam about 7 inches thick. The subsurface layer is about 25 inches thick. The upper part is black, firm silty clay loam; the next part is very dark gray, firm silty clay; and the lower part is very dark gray, very firm silty clay. The subsoil extends to a depth of about 60 inches. It is mottled. The upper part is dark gray, very firm silty clay; the next part is dark grayish brown, very firm silty clay loam; and the lower part is grayish brown, firm silty clay loam. In some areas the surface soil is thinner. In other areas the subsoil has less clay. In some places the seasonal high water table is more than 2 feet below the surface. In other places the soil has carbonates within a depth of 40 inches.

Included with this soil in mapping are small areas of the poorly drained Harpster and Selma and well drained Plano soils. These soils are on knobs and slight rises above the Shiloh soil. Harpster soils contain less clay than the Shiloh soil and are calcareous. Selma soils contain less clay and more sand than the Shiloh soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Shiloh soil at a moderately slow rate. Surface runoff is very slow or ponded. The seasonal high water table is 1 foot above to 2 feet below the surface during the wettest periods of the year. Available water capacity and organic matter content are high. The shrink-swell potential and the potential for frost action also are high.

Most areas are cultivated. This soil is well suited to cultivated crops. It is generally unsuited to dwellings and septic tank absorption fields because of the ponding. It is poorly suited to local roads and streets.

In areas used for corn, soybeans, or small grain, the ponding is a hazard and the seasonal high water table is a limitation. The wetness delays planting or interferes with harvesting in many years. Surface ditches, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available. The wetness of this soil has been sufficiently reduced by a drainage system for production of the crops commonly grown in the county. Measures that maintain or improve the drainage system are needed. Tillage when the soil is wet causes surface compaction and cloddiness. Adding organic material helps to maintain or improve tilth and fertility.

If this soil is used as a site for local roads and streets, low strength, the shrink-swell potential, and the seasonal high water table are limitations and the ponding is a hazard. Strengthening or replacing the base material helps to prevent the damage caused by low strength and by shrinking and swelling. Constructing open ditches, which remove excess water, and raising the roadbed with suitable fill material reduce the wetness and the hazard of ponding.

The land capability classification is IIw.

145C2—Saybrook silt loam, 5 to 12 percent slopes, eroded. This sloping, well drained soil is on uplands. Individual areas range from 3 to 40 acres in size.

Typically, the surface layer is mixed very dark grayish brown and dark yellowish brown, friable silt loam about 8 inches thick. The subsoil is about 24 inches thick. The upper part is brown and yellowish brown, friable silt loam; the next part is yellowish brown, firm silty clay loam; and the lower part is brown, mottled, firm, calcareous loam. The underlying material to a depth of about 60 inches also is brown, mottled, firm, calcareous loam. In some places the till is farther from the surface. In other places the underlying material is closer to the surface. In some areas the surface soil is lighter colored. In other areas the underlying material contains more sand.

Included with this soil in mapping are small areas of the somewhat poorly drained Ipava and poorly drained Sable and Sawmill soils. Ipava soils are on broad flats above the Saybrook soil. Sable and Sawmill soils are in drainageways below the Saybrook soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the upper part of the Saybrook soil at a moderate rate and through the lower part at a moderately slow rate. Surface runoff is medium. Available water capacity is high. Organic matter content is moderate. The shrink-swell potential also is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is moderately suited to cultivated crops and to dwellings. It is well suited to pasture and hay. It is poorly suited to local roads and streets and to septic tank absorption fields.

In areas used for corn, soybeans, or small grain, erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, contour farming, and stripcropping help to control erosion. Tillage when the soil is wet causes surface compaction and cloddiness and excessive runoff and erosion. Adding organic material helps to maintain or improve tilth and fertility.

In areas used for pasture or hay, erosion is a hazard. Overgrazing reduces forage yields and causes surface compaction and excessive runoff and erosion. Timely deferment of grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and minimize erosion.

If this soil is used as a site for dwellings, the slope is a limitation. Cutting, filling, and land shaping help to overcome this limitation.

If this soil is used as a site for septic tank absorption fields, the restricted permeability is a limitation. Increasing the size of the filter field or replacing the soil with material that is more permeable helps to overcome this limitation.

If this soil is used as a site for local roads and streets, low strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

The land capability classification is IIIe.

148—Proctor silt loam. This nearly level, well drained soil is on terraces. Individual areas range from 3 to 55 acres in size.

Typically, the surface soil is very dark grayish brown, friable silt loam about 19 inches thick. The subsoil is about 29 inches thick. The upper part is brown and dark yellowish brown, friable silty clay loam; the next part is dark yellowish brown, friable loam; and the lower part is dark yellowish brown, stratified loam and sandy loam. The underlying material to a depth of about 60 inches is dark yellowish brown, very friable sandy loam that has

strata of loamy sand and gravelly clay loam. In some places the subsoil is more sandy. In other places the surface soil is thinner and lighter colored. In some areas the loamy underlying material is farther from the surface. In other areas depth to the seasonal high water table is less than 25 inches.

Included with this soil in mapping are small areas of the well drained Huntsville, Onarga, and Ross soils. Huntsville and Ross soils are subject to flooding and are in the lower landscape positions. Onarga soils contain more sand than the Proctor soil. They are on side slopes below the Proctor soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the upper part of the Proctor soil at a moderate rate and through the lower part at a moderate or moderately rapid rate. Surface runoff is slow. Available water capacity is high. Organic matter content is moderate. The shrink-swell potential also is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops and to pasture and hay. It is moderately suited to dwellings and septic tank absorption fields. It is poorly suited to local roads and streets.

No major limitations affect the use of this soil for corn, soybeans, or small grain. Tillage when the soil is wet causes surface compaction and cloddiness. Adding organic material helps to maintain or improve tilth and fertility.

If this soil is used as a site for dwellings without basements, the shrink-swell potential is a limitation. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the restricted permeability is a limitation. Increasing the size of the filter field or replacing the soil with material that is more permeable helps to overcome this limitation.

If this soil is used as a site for local roads and streets, low strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

The land capability classification is I.

150A—Onarga sandy loam, 0 to 3 percent slopes. This nearly level, well drained soil is on terraces. Individual areas range from 3 to 430 acres in size.

Typically, the surface layer is very dark grayish brown, friable sandy loam about 11 inches thick. The subsoil is about 22 inches thick. It is dark brown and brown. The upper part is friable loam, and the lower part is very friable loamy sand. The underlying material to a depth of about 60 inches is brown, loose loamy sand. In some places the subsoil has more clay. In other places the surface soil is thinner and lighter colored. In some areas the subsoil has less clay. In other areas the soil has less clay throughout.

Included with this soil in mapping are small areas of the somewhat poorly drained La Hogue and poorly drained Orio and Selma soils. La Hogue soils are in shallow depressions and drainageways below the Onarga soil. Orio and Selma soils are on broad flats below the Onarga soil. Included soils make up 2 to 5 percent of the unit.

Water and air move through the upper part of the Onarga soil at a moderate or moderately rapid rate and through the lower part at a rapid rate. Surface runoff is slow. Available water capacity and organic matter content are moderate. The potential for frost action also is moderate.

Most areas are cultivated. This soil is moderately suited to cultivated crops, to pasture and hay, and to local roads and streets. It is well suited to dwellings and poorly suited to septic tank absorption fields. The soil is a probable source of sand.

In areas used for corn, soybeans, or small grain, soil blowing is a hazard and the moderate available water capacity is a limitation. A conservation tillage system that leaves crop residue on the surface and field windbreaks help to control soil blowing and conserve moisture. Irrigation can help to compensate for the moderate available water capacity. Adding organic material increases the available water capacity and improves fertility.

In areas used for pasture or hay, soil blowing is a hazard and the moderate available water capacity is a limitation. Bare spots, thin stands of plants, and recently planted areas are subject to soil blowing. Maintaining a thick, healthy plant cover minimizes soil blowing. Planting drought-resistant grasses and legumes helps to establish a plant cover. Timely deferment of grazing, rotation grazing, applications of fertilizer, and irrigation help to maintain the quality of the plants.

If this soil is used as a site for septic tank absorption fields, a poor filtering capacity can result in pollution of the ground water by the effluent. Replacing the soil with several feet of suitable loamy material improves the filtering capacity. An alternative is a system that includes a sealed sand filter and a disinfection tank.

If this soil is used as a site for local roads and streets, the potential for frost action is a limitation. Strengthening or replacing the base material helps to overcome this limitation.

The land capability classification is IIs.

150B—Onarga sandy loam, 3 to 7 percent slopes. This gently sloping, well drained soil is on terraces. Individual areas range from 3 to 165 acres in size.

Typically, the surface layer is very dark grayish brown, friable sandy loam about 8 inches thick. The subsurface layer is dark brown, friable loamy sand about 9 inches thick. The subsoil is about 28 inches thick. The upper part is dark yellowish brown, friable sandy loam; the next part is yellowish brown, very friable loamy sand; and the lower part is yellowish brown, very friable sand. The underlying material to a depth of about 60 inches is yellowish brown, loose sand. In some places the subsoil has more clay. In other places the surface soil is thinner and lighter colored. In some areas the subsoil has less clay. In other areas the soil has less clay throughout.

Included with this soil in mapping are small areas of the somewhat poorly drained La Hogue and poorly drained Orio and Selma soils. La Hogue soils are in shallow depressions and drainageways below the Onarga soil. Orio and Selma soils are on broad flats below the Onarga soil. Included soils make up 2 to 5 percent of the unit.

Water and air move through the upper part of the Onarga soil at a moderate or moderately rapid rate and through the lower part at a rapid rate. Surface runoff is medium. Available water capacity and organic matter content are moderate. The potential for frost action also is moderate.

Most areas are cultivated. This soil is moderately suited to cultivated crops, to pasture and hay, and to local roads and streets. It is well suited to dwellings and poorly suited to septic tank absorption fields.

In areas used for corn, soybeans, or small grain, erosion and soil blowing are hazards and the moderate available water capacity is a limitation. A conservation tillage system that leaves crop residue on the surface and field windbreaks help to control erosion and soil blowing and conserve moisture. Irrigation can help to compensate for the moderate available water capacity. Adding organic material increases the available water capacity and improves fertility.

In areas used for pasture or hay, erosion and soil blowing are hazards and the moderate available water capacity is a limitation. Overgrazing reduces forage yields and causes surface compaction and excessive runoff and erosion. Timely deferment of grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and minimize erosion. Bare spots, thin stands of plants, and recently planted areas are subject to soil blowing. Maintaining a thick, healthy plant cover minimizes soil blowing. Planting drought-resistant grasses and legumes helps to establish a plant cover. Irrigation helps to maintain the quality of the plants.

If this soil is used as a site for septic tank absorption fields, a poor filtering capacity can result in pollution of the ground water by the effluent. Replacing the soil with several feet of suitable loamy material improves the filtering capacity. An alternative is a system that includes a sealed sand filter and a disinfection tank.

If this soil is used as a site for local roads and streets, the potential for frost action is a limitation. Strengthening or replacing the base material helps to overcome this limitation.

The land capability classification is IIe.

151—Ridgeville sandy loam. This nearly level, somewhat poorly drained soil is on stream terraces and outwash plains. It occurs as one area on the boundary between Tazewell County and Mason County.

Typically, the surface soil is very dark grayish brown, friable sandy loam about 18 inches thick. The subsoil is dark grayish brown, mottled, friable sandy loam about 18 inches thick. The underlying material to a depth of about 60 inches is light brownish gray, mottled, loose sand. In some areas the soil contains more clay. In other areas it contains less clay. In places the upper part of the subsoil is darker.

Included with this soil in mapping are small areas of the somewhat poorly drained La Hogue, well drained Onarga, and poorly drained Selma soils. La Hogue soils are in landscape positions similar to those of the Ridgeville soil. Onarga soils are on the slightly higher parts of the landscape. Selma soils are on the slightly lower parts of the landscape. Included soils make up 1 to 10 percent of the unit.

Water and air move through the upper part of the Ridgeville soil at a moderate rate and through the lower part at a moderately rapid rate. Surface runoff is slow. The seasonal high water table is 1 to 3 feet below the surface during the wettest periods of the year. Available water capacity is moderate. Organic matter content also is moderate. The potential for frost action is low.

Most areas are cultivated. This soil is moderately suited to cultivated crops. It is well suited to pasture and hay. It is poorly suited to dwellings and septic tank absorption fields and moderately suited to local roads and streets.

In areas used for corn, soybeans, or small grain, soil blowing is a hazard and the seasonal high water table and the moderate available water capacity are limitations. Field windbreaks and a conservation tillage system that leaves crop residue on the surface help to control soil blowing and conserve moisture. Irrigation can help to compensate for the moderate available water capacity. The wetness delays planting or

interferes with harvesting in some years. Subsurface tile drains function satisfactorily if suitable outlets are available. Measures that maintain the drainage system are needed. Adding organic material increases the available water capacity and improves fertility.

If this soil is used as a site for dwellings, the seasonal high water table is a limitation. Installing tile drains around the footings helps to lower the water table.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table is a limitation. Installing tile drains around the perimeter of the filter field increases the depth to the water table. Grading and land shaping help to divert surface water from the filter field.

If this soil is used as a site for local roads and streets, the potential for frost action is a limitation. Strengthening or replacing the base material helps to overcome this limitation.

The land capability classification is IIs.

152—Drummer silty clay loam. This nearly level, poorly drained soil is in broad, low areas and drainageways on stream terraces. It is ponded for brief periods in spring. Individual areas are irregular in shape and range from 3 to more than 800 acres in size.

Typically, the surface layer is black, friable silty clay loam about 9 inches thick. The subsurface layer is black, mottled, friable silty clay loam about 10 inches thick. The subsoil is about 34 inches thick. It is mottled and friable. The upper part is dark grayish brown silty clay loam, the next part is light olive gray silty clay loam, and the lower part is light olive gray silt loam. The underlying material to a depth of about 60 inches is mottled light olive gray, olive, and yellowish brown, friable, stratified sandy loam, loamy sand, and silt loam. In a few places the upper part of the soil contains more clay or more sand. In some areas the underlying material is sand. In a few areas free carbonates are within a depth of 35 inches.

Included with this soil in mapping are small areas of the somewhat poorly drained Elburn and poorly drained, calcareous Harpster soils. Elburn soils are slightly higher on the landscape than the Drummer soil. Harpster soils are in landscape positions similar to those of the Drummer soil. Included soils make up 1 to 10 percent of the unit.

Water and air move through the Drummer soil at a moderate rate. Surface runoff is slow to ponded. The seasonal high water table is 0.5 foot above to 2.0 feet below the surface during spring. Available water capacity is high. Organic matter content also is high. The surface layer may become compact and cloddy if it is tilled when too wet. The shrink-swell potential is moderate.

Most areas are cultivated. This soil is well suited to cultivated crops. It is generally unsuited to dwellings and septic tank absorption fields because of the ponding. It is poorly suited to local roads and streets.

The wetness of this soil has been sufficiently reduced by a drainage system for the production of corn, soybeans, and small grain. Measures that maintain or improve the drainage system are needed. Surface drains, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available. Land grading reduces the hazard of ponding. Applying a conservation tillage system that leaves crop residue on the surface after planting and returning crop residue to the soil improve tilth, minimize surface compaction and crusting, and increase the rate of water infiltration.

If this soil is used as a site for local roads and streets, low strength and the potential for frost action are limitations and the ponding is a hazard. Strengthening or replacing the base material helps to prevent the damage caused by low strength and frost action. Constructing open ditches, which remove excess water, and raising the roadbed with suitable fill material reduce the hazard of ponding.

The land capability classification is IIw.

171C2—Catlin silt loam, 4 to 10 percent slopes, eroded. This sloping, moderately well drained soil is on uplands. Individual areas range from 3 to 170 acres in size.

Typically, the surface layer is mixed very dark grayish brown and yellowish brown, friable silt loam about 7 inches thick. The subsoil is about 45 inches thick. It is yellowish brown and friable. In sequence downward, it is silty clay loam, mottled silty clay loam, mottled silt loam, and mottled clay loam. The underlying material to a depth of about 60 inches is brown, friable loam. In some areas the surface layer is thinner and lighter colored. In other areas glacial till is closer to the surface. In some places it is farther from the surface. In other places slopes are less than 5 percent.

Included with this soil in mapping are small areas of the somewhat poorly drained Ipava and Radford and well drained Strawn soils. Ipava soils formed in loess. They are on foot slopes below the Catlin soil. Radford soils formed in silty alluvium over a buried soil. They are in drainageways below the Catlin soil. Strawn soils formed in glacial till. They are on side slopes adjacent to the Catlin soil. Included soils make up 10 to 15 percent of the unit.

Water and air move through the Catlin soil at a moderate rate. Surface runoff is medium. The seasonal high water table is 3.5 to 6.0 feet below the surface

during the wettest periods of the year. Available water capacity is high. Organic matter content is moderate. The shrink-swell potential also is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is moderately suited to cultivated crops and to dwellings. It is well suited to pasture and hay and to woodland. It is poorly suited to septic tank absorption fields and to local roads and streets.

In areas used for corn, soybeans, or small grain, erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, contour farming, and stripcropping help to control erosion. Tillage when the soil is wet causes surface compaction and cloddiness and excessive runoff and erosion. Adding organic material helps to maintain or improve tilth and fertility.

In areas used for pasture or hay, erosion is a hazard. Overgrazing reduces forage yields and causes surface compaction and excessive runoff and erosion. Timely deferment of grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and minimize erosion.

If this soil is used as a site for dwellings, the shrink-swell potential is a limitation. The seasonal high water table also is a limitation on sites for dwellings with basements. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling. Installing tile drains around the footings helps to lower the water table.

If this soil is used as a site for septic tank absorption fields, the restricted permeability and the seasonal high water table are limitations. Increasing the size of the filter field or replacing the soil with material that is more permeable helps to overcome the restricted permeability. Installing tile drains around the perimeter of the filter field helps to lower the water table.

If this soil is used as a site for local roads and streets, low strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

The land capability classification is IIIe.

198—Elburn silt loam. This nearly level, somewhat poorly drained soil is on terraces. Individual areas range from 3 to 240 acres in size.

Typically, the surface layer is very dark brown, friable silt loam about 21 inches thick. The subsoil is about 55 inches thick. It is mottled and friable. The upper part is brown silt loam, the next part is yellowish brown and light olive brown silty clay loam, and the lower part is light olive brown silt loam. The underlying material to a depth of about 85 inches is light olive brown, mottled, friable, stratified silt loam, silty clay loam, and loam. In some places the soil contains more sand. In other places depth to the seasonal high water table is less than 1 foot.

Included with this soil in mapping are small areas of the poorly drained Edgington and Orio and well drained Plano soils. Edgington and Orio soils are on the slightly lower parts of the landscape. Plano soils are on the higher parts of the landscape. Included soils make up 5 to 10 percent of the unit.

Water and air move through the Elburn soil at a moderate rate. Surface runoff is slow. The seasonal high water table is 1 to 3 feet below the surface during the wettest periods of the year. Available water capacity is high. Organic matter content also is high. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops and to pasture and hay. It is poorly suited to dwellings, septic tank absorption fields, and local roads and streets.

In areas used for corn, soybeans, or small grain, the seasonal high water table is a limitation. The wetness delays planting or interferes with harvesting in some years. Subsurface tile drains function satisfactorily if suitable outlets are available. Measures that maintain the drainage system are needed. Tillage when the soil is wet causes surface compaction and cloddiness. Adding organic material helps to maintain or improve tilth and fertility.

If this soil is used as a site for dwellings, the seasonal high water table is a limitation. Installing tile drains around the footings helps to lower the water table.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table is a limitation. Installing tile drains around the perimeter of the filter field increases the depth to the water table. Grading and land shaping help to divert surface water from the filter field.

If this soil is used as a site for local roads and streets, low strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

The land capability classification is I.

199A—Plano silt loam, 0 to 2 percent slopes. This nearly level, well drained soil is on terraces and uplands. Individual areas range from 3 to 4,500 acres in size.

Typically, the surface layer is very dark brown, friable silt loam about 10 inches thick. The subsurface layer is

black and dark brown, friable silt loam about 12 inches thick. The subsoil is friable silt loam about 29 inches thick. The upper part is dark yellowish brown, and the lower part is yellowish brown. The underlying material to a depth of about 60 inches is brownish yellow and light olive brown, friable silt loam and loam. In some places the subsurface layer is thicker. In other places the soil contains more sand. In some areas the loess is less than 40 or more than 70 inches thick. In other areas depth to the seasonal high water table is less than 6 feet.

Included with this soil in mapping are small areas of the poorly drained Edgington and Orio and somewhat poorly drained Elburn soils. These soils are on the slightly lower parts of the landscape. They make up 5 to 10 percent of the unit.

Water and air move through the Plano soil at a moderate rate. Surface runoff is slow. Available water capacity is high. Organic matter content also is high. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, and to septic tank absorption fields. It is moderately suited to dwellings and poorly suited to local roads and streets.

No major limitations affect the use of this soil for corn, soybeans, or small grain. Tillage when the soil is wet causes surface compaction and cloddiness. Adding organic material helps to maintain or improve tilth and fertility.

If this soil is used as a site for dwellings, the shrink-swell potential is a limitation. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for local roads and streets, low strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

The land capability classification is I.

199B—Plano silt loam, 2 to 5 percent slopes. This gently sloping, moderately well drained soil is on terraces and uplands. Individual areas range from 3 to 100 acres in size.

Typically, the surface layer is very dark grayish brown, friable silt loam about 9 inches thick. The subsurface layer also is very dark grayish brown, friable silt loam. It is about 4 inches thick. The subsoil is about 40 inches thick. It is friable. In sequence downward, it is dark yellowish brown silty clay loam; yellowish brown, mottled silty clay loam; dark yellowish brown, mottled silt loam; and dark yellowish brown sandy loam. The underlying material to a depth of about 60 inches is light olive gray, mottled, friable, stratified silt loam to sandy loam. In some places the surface layer is lighter colored. In other places the subsurface layer is thicker. In some areas the loess is less than 40 or more than 70 inches thick. In other areas depth to the seasonal high water table is more than 6 feet.

Included with this soil in mapping are small areas of the poorly drained Edgington and somewhat poorly drained Ipava soils. These soils are on the slightly lower parts of the landscape. They make up 5 to 10 percent of the unit.

Water and air move through the Plano soil at a moderate rate. Surface runoff is medium. The seasonal high water table is 3 to 6 feet below the surface during the wettest periods of the year. Available water capacity is high. Organic matter content is moderate. The shrink-swell potential also is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops and to pasture and hay. It is moderately suited to dwellings. It is poorly suited to local roads and streets and to septic tank absorption fields.

In areas used for corn, soybeans, or small grain, erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, contour farming, and stripcropping help to control erosion. Tillage when the soil is wet causes surface compaction and cloddiness and excessive runoff and erosion. Adding organic material helps to maintain or improve tilth and fertility.

In areas used for pasture or hay, erosion is a hazard. Overgrazing reduces forage yields and causes surface compaction and excessive runoff and erosion. Timely deferment of grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and minimize erosion.

If this soil is used as a site for dwellings, the shrink-swell potential is a limitation. The seasonal high water table also is a limitation on sites for dwellings with basements. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling. Installing tile drains around the footings helps to lower the water table.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table is a limitation. Installing tile drains around the perimeter of the filter field helps to lower the water table.

If this soil is used as a site for local roads and streets, low strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

The land capability classification is IIe.

200—Orio fine sandy loam. This nearly level, poorly drained soil is on terraces. It is ponded for brief periods from March through May. Individual areas range from 3 to 800 acres in size.

Typically, the surface layer is mixed very dark gray and dark grayish brown, friable fine sandy loam about 9 inches thick. The subsurface layer is about 12 inches of grayish brown, very friable loamy fine sand and fine sandy loam. The subsoil is about 22 inches thick. It is mottled and friable. The upper part is grayish brown loam, the next part is grayish brown clay loam, and the lower part is light brownish gray fine sandy loam. The underlying material to a depth of about 60 inches is light olive gray and light gray, mottled, friable, stratified fine sandy loam, sandy clay loam, and loamy fine sand. In some places the surface layer is thinner. In other places the subsurface layer is thicker. In some areas the surface soil contains less sand. In other areas the subsoil contains less clay. In places the solum is less than 35 inches thick.

Included with this soil in mapping are small areas of the somewhat poorly drained La Hogue and well drained Onarga soils. These soils are on the slightly higher parts of the landscape. They make up 5 to 10 percent of the unit.

Water and air move through the upper part of the Orio soil at a moderately slow rate and through the lower part at a rapid rate. Surface runoff is very slow or ponded. The seasonal high water table is 0.5 foot above to 1.0 foot below the surface during the wettest periods of the year. Available water capacity is moderate. Organic matter content is moderately low. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops. It is generally unsuited to dwellings and septic tank absorption fields because of the ponding. It is poorly suited to local roads and streets.

In areas used for corn, soybeans, or small grain, the ponding is a hazard and the seasonal high water table is a limitation. The wetness delays planting or interferes with harvesting in many years. Surface ditches, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available. The wetness of this soil has been sufficiently reduced by a drainage system for production of the crops commonly grown in the county. Measures that maintain or improve the drainage system are needed. Tillage when the soil is wet causes surface compaction and cloddiness. Adding organic material helps to maintain or improve tilth and fertility.

If this soil is used as a site for local roads and streets, the potential for frost action is a limitation and the ponding is a hazard. Strengthening or replacing the base material helps to prevent the damage caused by frost action. Constructing open ditches, which remove excess water, and raising the roadbed with suitable fill material reduce the wetness and the hazard of ponding.

The land capability classification is IIw.

201—Gilford sandy loam. This nearly level, poorly drained soil is in low areas on outwash plains or lake plains. It is ponded for brief periods in spring. Individual areas are irregular in shape and range from 3 to 220 acres in size.

Typically, the surface layer is black, friable sandy loam about 9 inches thick. The subsurface layer is very dark gray, friable sandy loam about 6 inches thick. The subsoil is about 21 inches thick. It is dark grayish brown and mottled. The upper part is friable sandy loam, and the lower part is very friable loamy sand. The underlying material to a depth of about 60 inches is light brownish gray and yellowish brown, mottled, loose sand. In places the subsurface layer is thicker. In some areas the subsoil contains more clay. In other areas it contains less clay.

Included with this soil in mapping are small areas of the well drained Onarga and somewhat poorly drained Ridgeville soils. These soils are higher on the landscape than the Gilford soil. They make up 1 to 10 percent of the unit.

Water and air move through the upper part of the Gilford soil at a moderately rapid rate and through the lower part at a rapid rate. Surface runoff is very slow or ponded. The seasonal high water table is 0.5 foot above to 1.0 foot below the surface during spring. Available water capacity is moderate. Organic matter content also is moderate.

Most areas are cultivated. This soil is moderately suited to cultivated crops. It is generally unsuited to dwellings and septic tank absorption fields because of the ponding. It is poorly suited to local roads and streets.

The wetness of this soil has been sufficiently reduced by a drainage system for the production of corn, soybeans, and small grain. Measures that maintain or improve the drainage system are needed. Surface drains, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available. Land grading reduces the hazard of ponding. A system of conservation tillage that leaves crop residue on the surface after planting and field windbreaks conserve moisture and help to prevent excessive soil loss and the crop damage caused by windblown soil particles. Returning crop residue to the soil helps to maintain tilth and fertility.

If this soil is used as a site for local roads and streets, the potential for frost action is a limitation and

the ponding is a hazard. Strengthening or replacing the base material helps to prevent the damage caused by frost action. Constructing open ditches, which remove excess water, and raising the roadbed with suitable fill material reduce the hazard of ponding.

The land capability classification is IIw.

221C2—Parr silt loam, 5 to 12 percent slopes, eroded. This sloping, well drained soil is on uplands. Individual areas range from 5 to 50 acres in size.

Typically, the surface layer is very dark grayish brown, friable silt loam about 8 inches thick. The subsoil is clay loam about 18 inches thick. The upper part is brown and friable, and the lower part is yellowish brown and firm. The underlying material to a depth of about 60 inches is brown, firm, calcareous loam. In some places the surface layer is lighter colored. In other places the solum is less than 24 inches thick. In some areas the loess is more than 18 inches thick.

Included with this soil in mapping are small areas of the well drained Catlin and somewhat poorly drained Ipava soils. Catlin soils contain less sand in the subsoil than the Parr soil. They are in landscape positions similar to those of the Parr soil. Ipava soils are on the lower parts of the landscape. Included soils make up 2 to 10 percent of the unit.

Water and air move through the upper part of the Parr soil at a moderate rate and through the lower part at a moderately slow rate. Surface runoff is medium. Available water capacity is high. Organic matter content is moderate. The shrink-swell potential and the potential for frost action also are moderate.

Most areas are cultivated. This soil is moderately suited to cultivated crops, to dwellings, and to local roads and streets. It is well suited to pasture and hay and to woodland. It is poorly suited to septic tank absorption fields.

In areas used for corn, soybeans, or small grain, erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, contour farming, and stripcropping help to control erosion. Tillage when the soil is wet causes surface compaction and cloddiness and excessive runoff and erosion. Adding organic material helps to maintain or improve tilth and fertility.

In areas used for pasture or hay, erosion is a hazard. Overgrazing reduces forage yields and causes surface compaction and excessive runoff and erosion. Timely deferment of grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and minimize erosion.

If this soil is used as a site for dwellings, the shrink-swell potential and the slope are limitations. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling. Cutting, filling, and land shaping help to overcome the slope.

If this soil is used as a site for septic tank absorption fields, the restricted permeability is a limitation. Increasing the size of the filter field or replacing the soil with material that is more permeable helps to overcome this limitation.

If this soil is used as a site for local roads and streets, low strength, the shrink-swell potential, and the slope are limitations. Strengthening or replacing the base material and cutting, filling, and land shaping help to overcome these limitations.

The land capability classification is IIIe.

224E—Strawn loam, 15 to 20 percent slopes. This moderately steep, well drained soil is on uplands. Individual areas range from 3 to 15 acres in size.

Typically, the surface layer is brown, friable loam about 7 inches thick. The subsoil is dark brown, firm clay loam about 15 inches thick. The underlying material to a depth of about 60 inches is brown, mottled, firm, calcareous loam. In some places silty material extends to a depth of 36 inches. In other places the surface layer is calcareous.

Included with this soil in mapping are small areas of the moderately well drained Birkbeck and poorly drained Sawmill soils. Birkbeck soils have more than 40 inches of loess. They are on the higher parts of the landscape. Sawmill soils are on the lower parts of the landscape. Included soils make up 5 to 10 percent of the unit.

Water and air move through the upper part of the Strawn soil at a moderate rate and through the lower part at a moderately slow rate. Surface runoff is very rapid. Available water capacity is moderate. Organic matter content is moderately low. The shrink-swell potential and the potential for frost action are moderate.

Most areas are pastured. This soil is moderately suited to woodland and poorly suited to pasture and hay, dwellings, septic tank absorption fields, and local roads and streets. It is generally unsuited to cultivated crops because of the slope.

In the areas used for pasture or hay, erosion is a hazard and the slope is a limitation. Overgrazing reduces forage yields and causes surface compaction and excessive runoff and erosion. Timely deferment of grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and minimize erosion. Special equipment and techniques are needed when seeds are planted and chemicals and fertilizer are

applied. The steepest areas are unsuitable for hay because the slope limits the use of harvesting equipment.

In areas used as woodland, erosion is a hazard and the slope is a limitation. An equipment limitation and seedling mortality also are management concerns. Building logging roads and skid trails on or nearly on the contour and diverting surface water help to control erosion. Limiting logging activities to periods when the soil is dry or frozen helps to prevent excessive rutting and erosion. Seeding all bare areas to grasses or a grass-legume mixture after logging has been completed helps to control erosion. In the steepest areas the logs should be skidded uphill with a cable and winch. The seedling mortality rate can be reduced by selecting planting stock that is older and larger than is typical and by mulching. Some replanting may be needed. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

If this soil is used as a site for dwellings, the slope is a limitation. Cutting, filling, and land shaping help to overcome this limitation.

If this soil is used as a site for septic tank absorption fields, the restricted permeability and the slope are limitations. Increasing the size of the filter field or replacing the soil with material that is more permeable helps to overcome the restricted permeability. Installing the filter field lines on the contour and cutting, filling, and land shaping help to overcome the slope.

If this soil is used as a site for local roads and streets, the slope is a limitation. Cutting, filling, and land shaping help to overcome this limitation.

The land capability classification is IVe.

233C2—Birkbeck silt loam, 5 to 10 percent slopes, eroded. This sloping, moderately well drained soil is on uplands. Individual areas range from 3 to 60 acres in size.

Typically, the surface layer is mixed dark grayish brown and dark yellowish brown, friable silt loam about 7 inches thick. The subsoil is about 40 inches thick. The upper part is dark yellowish brown, firm silty clay loam; the next part is yellowish brown, firm silty clay loam and friable silt loam; and the lower part is yellowish brown, friable loam. The underlying material to a depth of about 60 inches also is yellowish brown, friable loam. It is calcareous in the lower part. In some places the surface layer is thicker and darker. In other places the loess is less than 40 or more than 60 inches thick.

Included with this soil in mapping are small areas of the well drained Miami, somewhat poorly drained Stronghurst, and moderately well drained Tama soils. Miami soils are on side slopes on the lower parts of the landscape. Stronghurst and Tama soils formed entirely in loess. They are on the higher parts of the landscape. Included soils make up 2 to 10 percent of the unit.

Water and air move through the upper part of the Birkbeck soil at a moderate rate and through the lower part at a moderately slow rate. Surface runoff is medium. The seasonal high water table is 3 to 6 feet below the surface during the wettest periods of the year. Available water capacity is high. Organic matter content is moderately low. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil moderately suited to cultivated crops and to dwellings. It is well suited to pasture and hay and to woodland. It is poorly suited to septic tank absorption fields and to local roads and streets.

In areas used for corn, soybeans, or small grain, erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, contour farming, and stripcropping help to control erosion. Tillage when the soil is wet causes surface compaction and cloddiness and excessive runoff and erosion. Adding organic material minimizes crusting and improves tilth and fertility.

In areas used for pasture or hay, erosion is a hazard. Overgrazing reduces forage yields and causes surface compaction and excessive runoff and erosion. Timely deferment of grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and minimize erosion.

If this soil is used as a site for dwellings, the shrink-swell potential is a limitation. The seasonal high water table also is a limitation on sites for dwellings with basements. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling. Installing tile drains around the footings helps to lower the water table.

If this soil is used as a site for septic tank absorption fields, the restricted permeability and the seasonal high water table are limitations. Increasing the size of the filter field or replacing the soil with material that is more permeable helps to overcome the restricted permeability. Installing tile drains around the perimeter of the filter field increases the depth to the water table. Grading and land shaping help to divert surface water from the filter field.

If this soil is used as a site for local roads and streets, low strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

The land capability classification is IIIe.

233C3—Birkbeck silty clay loam, 5 to 10 percent slopes, severely eroded. This sloping, moderately well drained soil is on uplands. Individual areas range from 5 to 30 acres in size.

Typically, the surface layer is mixed dark brown and yellowish brown, firm silty clay loam about 3 inches thick. The subsurface layer is brown, friable silty clay loam about 5 inches thick. The subsoil is about 36 inches thick. It is dark yellowish brown. The upper part is firm silty clay loam, and the lower part is friable silt loam. The underlying material to a depth of about 60 inches is brown, firm, calcareous loam. In some places the soil is less eroded. In other places the loess is less than 40 or more than 60 inches thick.

Included with this soil in mapping are small areas of the somewhat poorly drained Ipava and Stronghurst and well drained Miami soils. Ipava and Stronghurst soils formed entirely in loess. They are in nearly level areas on the higher parts of the landscape. Miami soils are on side slopes on the lower parts of the landscape. Included soils make up 2 to 10 percent of the unit.

Water and air move through the upper part of the Birkbeck soil at a moderate rate and through the lower part at a moderately slow rate. Surface runoff is rapid. The seasonal high water table is 3 to 6 feet below the surface during spring. Available water capacity is high. Organic matter content is low. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is poorly suited to cultivated crops, to septic tank absorption fields, and to local roads and streets. It is moderately suited to pasture and hay and to dwellings. It is well suited to woodland.

In areas used for corn, soybeans, or small grain, erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, contour farming, and stripcropping help to control erosion. Tillage when the soil is wet causes surface compaction and cloddiness and excessive runoff and erosion. Adding organic material minimizes crusting and improves tilth and fertility.

In areas used for pasture or hay, erosion is a hazard. Overgrazing reduces forage yields and causes surface compaction and excessive runoff and erosion. Timely deferment of grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and minimize erosion.

If this soil is used as a site for dwellings, the shrink-swell potential is a limitation. The seasonal high water table also is a limitation on sites for dwellings with basements. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling. Installing tile drains around the footings helps to lower the water table.

If this soil is used as a site for septic tank absorption fields, the restricted permeability and the seasonal high water table are limitations. Increasing the size of the filter field or replacing the soil with material that is more permeable helps to overcome the restricted permeability. Installing tile drains around the perimeter of the filter field increases the depth to the water table. Grading and land shaping help to divert surface water from the filter field.

If this soil is used as a site for local roads and streets, low strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

The land capability classification is IVe.

233D2—Birkbeck silt loam, 10 to 15 percent slopes, eroded. This strongly sloping, moderately well drained soil is on uplands. Individual areas range from 5 to 15 acres in size.

Typically, the surface layer is brown, friable silt loam about 6 inches thick. The subsoil is about 52 inches thick. It is friable. The upper part is dark yellowish brown silty clay loam; the next part is yellowish brown, mottled silty clay loam and loam; and the lower part is yellowish brown, mottled, calcareous loam. The underlying material to a depth of about 60 inches is yellowish brown, mottled, friable, calcareous loam. In some areas the soil is less eroded. In other areas it is more eroded. In places the loess is less than 40 or more than 60 inches thick.

Included with this soil in mapping are small areas of the somewhat poorly drained Ipava and Stronghurst and well drained Miami soils. Ipava and Stronghurst soils formed entirely in loess. They are in nearly level areas on the higher parts of the landscape. Miami soils are on side slopes on the lower parts of the landscape. Included soils make up 2 to 10 percent of the unit.

Water and air move through the upper part of the Birkbeck soil at a moderate rate and through the lower part at a moderately slow rate. Surface runoff is rapid. The seasonal high water table is 3 to 6 feet below the surface during spring. Available water capacity is high. Organic matter content is moderately low. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to woodland. It is moderately suited to pasture and hay and to dwellings. It is poorly suited to cultivated crops, to septic tank absorption fields, and to local roads and streets.

In areas used for corn, soybeans, or small grain, erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop

residue on the surface after planting, terraces, contour farming, and stripcropping help to control erosion. Tillage when the soil is wet causes surface compaction and cloddiness and excessive runoff and erosion. Adding organic material minimizes crusting and improves tilth and fertility.

In areas used for pasture or hay, erosion is a hazard. Overgrazing reduces forage yields and causes surface compaction and excessive runoff and erosion. Timely deferment of grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and minimize erosion.

If this soil is used as a site for dwellings, the shrink-swell potential and the slope are limitations. The seasonal high water table also is a limitation on sites for dwellings with basements. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling. Installing tile drains around the footings helps to lower the water table. Cutting, filling, and land shaping help to overcome the slope.

If this soil is used as a site for septic tank absorption fields, the restricted permeability and the seasonal high water table are limitations. Increasing the size of the filter field or replacing the soil with material that is more permeable helps to overcome the restricted permeability. Installing tile drains around the perimeter of the filter field increases the depth to the water table. Grading and land shaping help to divert surface water from the filter field.

If this soil is used as a site for local roads and streets, low strength, the potential for frost action, and the slope are limitations. Strengthening or replacing the base material and cutting, filling, and land shaping help to overcome these limitations.

The land capability classification is IIIe.

243A—St. Charles silt loam, 0 to 2 percent slopes. This nearly level, well drained soil is on terraces. Individual areas range from 5 to 35 acres in size.

Typically, the surface layer is brown, friable silt loam about 6 inches thick. The subsurface layer also is brown, friable silt loam. It is about 4 inches thick. The subsoil is about 45 inches thick. The upper part is brown and dark yellowish brown, firm silty clay loam; the next part is yellowish brown, firm silty clay loam; and the lower part is yellowish brown, friable loam. The underlying material to a depth of about 60 inches is yellowish brown, friable, stratified sandy loam and loam. In some places the surface layer is darker and thicker. In other places the loamy material is within a depth of 40 inches. In some areas the loess is more than 60 inches thick. In other areas the underlying material contains more sand.

Included with this soil in mapping are small areas of the well drained Birkbeck and Casco soils. These soils are on side slopes on the lower parts of the landscape. Birkbeck soils have calcareous loam till within a depth of about 60 inches. Casco soils contain more sand than the St. Charles soil. Included soils make up 2 to 8 percent of the unit.

Water and air move through the St. Charles soil at a moderate rate. Surface runoff is slow. Available water capacity is high. Organic matter content is moderately low. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops, pasture and hay, woodland, and septic tank absorption fields. It is moderately suited to dwellings and poorly suited to local roads and streets.

No major limitations affect the use of this soil for corn, soybeans, or small grain. Tillage when the soil is wet causes surface compaction and cloddiness. Adding organic material minimizes crusting and improves tilth and fertility.

If this soil is used as a site for dwellings, the shrink-swell potential is a limitation. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for local roads and streets, low strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

The land capability classification is I.

243B—St. Charles silt loam, 2 to 5 percent slopes. This gently sloping, well drained soil is on terraces. Individual areas range from 5 to 100 acres in size.

Typically, the surface layer is brown, friable silt loam about 8 inches thick. The subsoil is about 52 inches thick. It is friable. The upper part is dark yellowish brown and yellowish brown silty clay loam; the next part is yellowish brown, mottled silty clay loam; and the lower part is yellowish brown, stratified silt loam and loam. The underlying material to a depth of about 70 inches is yellowish brown, loose gravelly loamy sand. In some places the surface layer is darker and thicker. In other places the loamy material is within a depth of 40 inches. In some areas the loess is more than 60 inches thick. In other areas the underlying material contains more sand.

Included with this soil in mapping are small areas of the well drained Casco, excessively drained Rodman, and somewhat poorly drained Stronghurst soils. Casco and Rodman soils contain more sand than the St. Charles soil. They are on side slopes on the lower parts of the landscape. Stronghurst soils are on the slightly

higher parts of the landscape. Included soils make up 5 to 15 percent of the unit.

Water and air move through the St. Charles soil at a moderate rate. Surface runoff is medium. Available water capacity is high. Organic matter content is moderately low. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops, pasture and hay, septic tank absorption fields, and woodland. It is moderately suited to dwellings. It is poorly suited to local roads and streets.

In areas used for corn, soybeans, or small grain, erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, contour farming, and stripcropping help to control erosion. Tillage when the soil is wet causes surface compaction and cloddiness and excessive runoff and erosion. Adding organic material helps to maintain or improve tilth and fertility.

In areas used for pasture or hay, erosion is a hazard. Overgrazing reduces forage yields and causes surface compaction and excessive runoff and erosion. Timely deferment of grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and minimize erosion.

If this soil is used as a site for dwellings, the shrink-swell potential is a limitation. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for local roads and streets, low strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

The land capability classification is IIe.

243C2—St. Charles silt loam, 5 to 10 percent slopes, eroded. This sloping, well drained soil is on terraces. Individual areas range from 5 to 70 acres in size.

Typically, the surface layer is brown, friable silt loam about 11 inches thick. The subsoil is about 43 inches thick. It is friable. The upper part is dark yellowish brown silty clay loam, the next part is yellowish brown silty clay loam, and the lower part is yellowish brown loam. The underlying material to a depth of about 60 inches is yellowish brown, very friable, stratified loam, sandy loam, and loamy sand. In some places the underlying material is within a depth of 40 inches. In other places the subsoil contains more sand. In some areas the loess is more than 60 inches thick.

Included with this soil in mapping are small areas of the well drained Casco, excessively drained Rodman, and somewhat poorly Radford soils. Casco and Rodman soils contain more sand than the St. Charles soil. They are on side slopes on the lower parts of the landscape. Radford soils are in drainageways on the lower parts of the landscape. Included soils make up 5 to 10 percent of the unit.

Water and air move through the St. Charles soil at a moderate rate. Surface runoff is medium. Available water capacity is high. Organic matter content is moderately low. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is moderately suited to cultivated crops and to dwellings. It is well suited to pasture and hay, to woodland, and to septic tank absorption fields. It is poorly suited to local roads and streets.

In areas used for corn, soybeans, or small grain, erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, contour farming, and stripcropping help to control erosion. Tillage when the soil is wet causes surface compaction and cloddiness and excessive runoff and erosion. Adding organic material helps to maintain or improve tilth and fertility.

In areas used for pasture or hay, erosion is a hazard. Overgrazing reduces forage yields and causes surface compaction and excessive runoff and erosion. Timely deferment of grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and minimize erosion.

If this soil is used as a site for dwellings, the shrink-swell potential is a limitation. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for local roads and streets, low strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

The land capability classification is IIIe.

266A—Disco sandy loam, 0 to 3 percent slopes. This nearly level, somewhat excessively drained soil is on terraces. Individual areas range from 3 to 60 acres in size.

Typically, the surface layer is very dark grayish brown, very friable sandy loam about 7 inches thick. The subsurface layer is very dark brown and very dark grayish brown, very friable sandy loam about 27 inches thick. The subsoil is brown, friable sandy loam about 7 inches thick. The underlying material to a depth of about 60 inches is yellowish brown and dark yellowish

brown, loose sand. In some areas the surface soil is thinner. In other areas it is more than 36 inches thick. In places the surface soil and subsoil contain less sand.

Included with this soil in mapping are small areas of the well drained Onarga and excessively drained Plainfield and Sparta soils. Onarga soils are on the slightly higher parts of the landscape or are in landscape positions similar to those of the Disco soil. Plainfield and Sparta soils are on the higher parts of the landscape. Included soils make up 10 to 15 percent of the unit.

Water and air move through the upper part of the Disco soil at a moderately rapid rate and through the lower part at a rapid rate. Surface runoff is slow. Available water capacity and organic matter content are moderate. The potential for frost action also is moderate.

Most areas are cultivated. This soil is moderately suited to cultivated crops and to local roads and streets. It is well suited to dwellings and poorly suited to septic tank absorption fields. The soil is a probable source of sand.

In areas used for corn, soybeans, or small grain, soil blowing is a hazard and the moderate available water capacity is a limitation. A conservation tillage system that leaves crop residue on the surface and field windbreaks help to control soil blowing and conserve moisture. Irrigation can help to compensate for the moderate available water capacity. Tillage when the soil is wet causes surface compaction and cloddiness. Adding organic material increases the available water capacity and improves fertility.

In areas used for pasture or hay, soil blowing is a hazard and the moderate available water capacity is a limitation. Bare spots, thin stands of plants, and recently planted areas are subject to soil blowing. Maintaining a thick, healthy plant cover minimizes soil blowing. Planting drought-resistant grasses and legumes helps to establish a plant cover. Timely deferment of grazing, rotation grazing, applications of fertilizer, and irrigation help to maintain the quality of the plants.

If this soil is used as a site for septic tank absorption fields, a poor filtering capacity can result in pollution of the ground water by the effluent. Replacing the soil with several feet of suitable loamy material improves the filtering capacity. An alternative is a system that includes a sealed sand filter and a disinfection tank.

If this soil is used as a site for local roads and streets, the potential for frost action is a limitation. Strengthening or replacing the base material helps to overcome this limitation.

The land capability classification is IIIs.

272—Edgington silt loam. This nearly level, poorly drained soil is on uplands. It is ponded for brief periods from February through April. Individual areas range from 3 to 60 acres in size.

Typically, the surface layer is very dark gray, friable silt loam about 6 inches thick. The subsurface layer is very dark gray and grayish brown, friable silt loam about 22 inches thick. The subsoil extends to a depth of 60 inches or more. The upper part is grayish brown, mottled, firm silty clay loam; the next part is grayish brown and strong brown, mottled, firm silty clay loam; and the lower part is mottled strong brown and grayish brown, friable silt loam. In some places the surface layer contains more sand. In other places the soil does not have a leached subsurface layer. In some areas the subsoil contains less clay.

Included with this soil in mapping are small areas of the somewhat poorly drained Ipava and moderately well drained Tama soils. These soils are on the slightly higher parts of the landscape. They make up 2 to 5 percent of the unit.

Water and air move through the Edgington soil at a slow rate. Surface runoff is slow to ponded. The seasonal high water table is 0.5 foot above to 2.0 feet below the surface during the wettest periods of the year. Available water capacity is very high. Organic matter content is moderate. The shrink-swell potential also is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops. It is generally unsuited to dwellings and septic tank absorption fields because of the ponding. It is poorly suited to local roads and streets.

In areas used for corn, soybeans, or small grain, the ponding is a hazard and the seasonal high water table is a limitation. The wetness delays planting or interferes with harvesting in many years. Surface ditches, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available. The wetness of this soil has been sufficiently reduced by a drainage system for production of the crops commonly grown in the county. Measures that maintain or improve the drainage system are needed. Tillage when the soil is wet causes surface compaction and cloddiness. Adding organic material helps to maintain or improve tilth and fertility.

If this soil is used as a site for local roads and streets, low strength, the potential for frost action, and the seasonal high water table are limitations and the ponding is a hazard. Strengthening or replacing the base material helps to prevent the damage caused by low strength and frost action. Constructing open ditches, which remove excess water, and raising the

roadbed with suitable fill material reduce the wetness and the hazard of ponding.

The land capability classification is IIw.

278—Stronghurst silt loam. This nearly level, somewhat poorly drained soil is on uplands. Individual areas range from 3 to 360 acres in size.

Typically, the surface layer is dark grayish brown, friable silt loam about 7 inches thick. The subsurface layer is grayish brown, friable silt loam about 5 inches thick. The subsoil is about 35 inches thick. It is brown and mottled. The upper part is firm silty clay loam, and the lower part is friable silt loam. The underlying material to a depth of about 60 inches is mottled yellowish brown and light brownish gray, friable silt loam. In some places the surface layer is darker. In other places the soil does not have a leached subsurface layer. In some areas the loess is less than 60 inches thick. In other areas depth to the seasonal high water table is more than 4 feet or less than 1 foot.

Included with this soil in mapping are small areas of the moderately well drained Downs and poorly drained Sable soils. Downs soils are on the slightly higher parts of the landscape. Sable soils are in shallow depressions on the lower parts of the landscape. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Stronghurst soil at a moderate rate. Surface runoff is slow. The seasonal high water table is 1 to 3 feet below the surface during the wettest periods of the year. Available water capacity is very high. Organic matter content is moderately low. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, and to woodland. It is poorly suited to dwellings, septic tank absorption fields, and local roads and streets.

In areas used for corn, soybeans, or small grain, the seasonal high water table is a limitation. The wetness delays planting or interferes with harvesting in some years. Subsurface tile drains function satisfactorily if suitable outlets are available. Measures that maintain the drainage system are needed. Tillage when the soil is wet causes surface compaction and cloddiness. Adding organic material minimizes crusting and improves tilth and fertility.

If this soil is used as a site for dwellings, the seasonal high water table is a limitation. Installing tile drains around the footings helps to lower the water table.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table is a limitation. Installing tile drains around the perimeter of the filter field helps to lower the water table. Grading and land shaping help to divert surface water from the filter field.

If this soil is used as a site for local roads and streets, low strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

The land capability classification is IIw.

279B2—Rozetta silt loam, 1 to 5 percent slopes, eroded. This gently sloping, moderately well drained soil is on uplands. Individual areas range from 3 to 70 acres in size.

Typically, the surface layer is brown, friable silt loam about 7 inches thick. The subsoil is friable silty clay loam about 37 inches thick. The upper part is dark yellowish brown and yellowish brown, and the lower part is yellowish brown and mottled. The underlying material to a depth of about 60 inches is yellowish brown, mottled, friable silt loam. In some places the surface layer is thicker. In other places the soil has a darker surface soil and does not have a subsurface layer. In some areas the loess is less than 60 inches thick. In other areas depth to the seasonal high water table is less than 4 feet or more than 6 feet.

Included with this soil in mapping are small areas of the somewhat poorly drained Atterberry and Ipava and poorly drained Sable soils. Atterberry and Ipava soils are on the lower parts of the landscape. Sable soils are in depressions on the lower parts of the landscape. Included soils make up 5 to 10 percent of the unit.

Water and air move through the Rozetta soil at a moderate rate. Surface runoff is medium. The seasonal high water table is 4 to 6 feet below the surface during the wettest periods of the year. Available water capacity is very high. Organic matter content is moderately low. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, and to woodland. It is moderately suited to dwellings. It is poorly suited to septic tank absorption fields and to local roads and streets.

In areas used for corn, soybeans, or small grain, erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, contour farming, and stripcropping help to control erosion. Tillage when the soil is wet causes surface compaction and cloddiness and excessive runoff and erosion. Adding organic material helps to maintain or improve tilth and fertility.

In areas used for pasture or hay, erosion is a hazard. Overgrazing reduces forage yields and causes surface compaction and excessive runoff and erosion. Timely deferment of grazing, rotation grazing, and applications

of fertilizer help to keep the plants in good condition and minimize erosion.

If this soil is used as a site for dwellings, the shrink-swell potential and the seasonal high water table are limitations. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling. Installing tile drains around the footings helps to lower the water table.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table is a limitation. Installing tile drains around the perimeter of the filter field helps to lower the water table.

If this soil is used as a site for local roads and streets, low strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

The land capability classification is IIe.

280C2—Fayette silt loam, 5 to 10 percent slopes, eroded. This sloping, well drained soil is on uplands. Individual areas range from 3 to 120 acres in size.

Typically, the surface layer is dark grayish brown, friable silt loam about 7 inches thick. The subsoil is about 53 inches thick. It is yellowish brown and friable. The upper part is silt loam and silty clay loam, the next part is mottled silty clay loam, and the lower part is silt loam. In some places the surface layer is darker and thicker. In other places, the loess is thinner and glacial till is within a depth of 60 inches. In some areas the soil is calcareous within a depth of 40 inches. In other areas depth to the seasonal high water table is less than 6 feet.

Included with this soil in mapping are small areas of the well drained Hennepin and Miami soils. These soils have less than 18 inches of loess. They are on side slopes on the lower parts of the landscape. They make up 5 to 10 percent of the unit.

Water and air move through the Fayette soil at a moderate rate. Surface runoff is medium. Available water capacity is very high. Organic matter content is moderately low. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is moderately suited to cultivated crops and to dwellings. It is well suited to pasture and hay, to woodland, and to septic tank absorption fields. It is poorly suited to local roads and streets.

In areas used for corn, soybeans, or small grain, erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, contour farming, and stripcropping help to control erosion. Tillage when the soil is wet causes surface compaction and cloddiness and excessive runoff and erosion. Adding organic material helps to maintain or improve tilth and fertility.

In areas used for pasture or hay, erosion is a hazard. Overgrazing reduces forage yields and causes surface compaction and excessive runoff and erosion. Timely deferment of grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and minimize erosion.

If this soil is used as a site for dwellings, the shrink-swell potential is a limitation. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for local roads and streets, low strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

The land capability classification is IIIe.

290A—Warsaw loam, 0 to 2 percent slopes. This nearly level, well drained soil is on terraces. Individual areas range from 5 to 180 acres in size.

Typically, the surface layer is very dark grayish brown, firm and friable loam about 12 inches thick. The subsoil is about 26 inches thick. It is firm. The upper part is dark brown loam and gravelly loam, and the lower part is dark yellowish brown gravelly loam and gravelly sandy clay loam. The underlying material to a depth of about 60 inches is yellowish brown, loose, stratified sand and gravel. In some places the subsoil contains more clay and sand. In other places the underlying material is farther from the surface. In some areas it has no gravel. In other areas the surface layer contains gravel.

Included with this soil in mapping are small areas of the poorly drained Ambraw and excessively drained Rodman and Sparta soils. Ambraw soils are on the slightly lower parts of the landscape. Rodman and Sparta soils are on the higher parts of the landscape. Included soils make up 5 to 15 percent of the unit.

Water and air move through the subsoil of the Warsaw soil at a moderate rate and through the underlying material at a very rapid rate. Surface runoff is slow. Available water capacity and organic matter content are moderate. The potential for frost action also is moderate.

Most areas are cultivated. This soil is well suited to dwellings, to woodland, and to pasture and hay. It is moderately suited to cultivated crops and to local roads and streets. It is poorly suited to septic tank absorption fields. The soil is a probable source of sand and gravel.

In areas used for corn, soybeans, or small grain, the moderate available water capacity is a limitation. A conservation tillage system that leaves crop residue on the surface and field windbreaks conserve moisture.

Irrigation can help to compensate for the moderate available water capacity. Tillage when the soil is wet causes surface compaction and cloddiness. Adding organic material helps to maintain or improve tilth and fertility.

If this soil is used as a site for septic tank absorption fields, a poor filtering capacity can result in pollution of the ground water by the effluent. Replacing the soil with several feet of suitable loamy material improves the filtering capacity. An alternative is a system that includes a sealed sand filter and a disinfection tank.

If this soil is used as a site for local roads and streets, the potential for frost action is a limitation. Strengthening or replacing the base material helps to overcome this limitation.

The land capability classification is IIs.

290B—Warsaw loam, 2 to 7 percent slopes. This gently sloping, well drained soil is on terraces. Individual areas range from 2 to 40 acres in size.

Typically, the surface layer is very dark brown, friable loam about 7 inches thick. The subsurface layer also is very dark brown, friable loam. It is about 10 inches thick. The subsoil is dark yellowish brown loam about 16 inches thick. The upper part is friable, and the lower part is very friable. The underlying material to a depth of about 60 inches is yellowish brown, loose, calcareous, stratified gravelly loamy sand and gravelly sand. In some places the subsoil contains more clay and sand. In other places the underlying material is farther from the surface. In some areas it has no gravel. In other areas the surface layer contains gravel.

Included with this soil in mapping are small areas of the excessively drained Rodman and Sparta soils. Rodman soils are on side slopes on the higher parts of the landscape. Sparta soils are in landscape positions similar to those of the Warsaw soil. Included soils make up 5 to 10 percent of the unit.

Water and air move through the upper part of the Warsaw soil at a moderate rate and through the lower part at a very rapid rate. Surface runoff is medium. Available water capacity and organic matter content are moderate. The potential for frost action also is moderate.

Most areas are cultivated. This soil is moderately suited to cultivated crops, to pasture and hay, and to local roads and streets. It is well suited to woodland and to dwellings. It is poorly suited to septic tank absorption fields. The soil is a probable source of sand and gravel.

In areas used for corn, soybeans, or small grain, a conservation tillage system that leaves crop residue on the surface and field windbreaks help to control erosion and conserve moisture. Irrigation can help to compensate for the moderate available water capacity. Tillage when the soil is wet causes surface compaction and cloddiness and excessive runoff and erosion. Adding organic material helps to maintain or improve tilth and fertility.

In areas used for pasture or hay, erosion is a hazard and the moderate available water capacity is a limitation. Overgrazing reduces forage yields and causes surface compaction and excessive runoff and erosion. Timely deferment of grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and minimize erosion. Planting drought-resistant grasses and legumes helps to establish a plant cover. Irrigation helps to maintain the quality of the plants.

If this soil is used as a site for septic tank absorption fields, a poor filtering capacity can result in pollution of the ground water by the effluent. Replacing the soil with several feet of suitable loamy material improves the filtering capacity. An alternative is a system that includes a sealed sand filter and a disinfection tank.

If this soil is used as a site for local roads and streets, the potential for frost action is a limitation. Strengthening or replacing the base material helps to overcome this limitation.

The land capability classification is IIe.

323C3—Casco clay loam, 5 to 12 percent slopes, severely eroded. This sloping, well drained soil is on terraces. Individual areas range from 3 to 25 acres in size.

Typically, the surface layer is dark brown, friable clay loam about 4 inches thick. The subsoil is brown, friable gravelly clay loam about 18 inches thick. The underlying material to a depth of about 60 inches is dark yellowish brown, loose, calcareous extremely gravelly sand. In some places the surface layer is darker. In other places it contains gravel. In some areas the subsoil contains less sand.

Included with this soil in mapping are small areas of the well drained Camden, Huntsville, and St. Charles soils. Camden and St. Charles soils contain less sand than the Casco soil. They are in landscape positions similar to those of the Casco soil. Huntsville soils are frequently flooded and are on the lower parts of the landscape. Included soils make up 5 to 10 percent of the unit.

Water and air move through the upper part of the Casco soil at a moderate rate and through the lower part at a very rapid rate. Surface runoff is medium. Available water capacity is moderate. Organic matter content is moderately low. The shrink-swell potential is moderate.

Most areas are cultivated. This soil is poorly suited to

cultivated crops, to pasture and hay, and to septic tank absorption fields. It is well suited to dwellings and moderately suited to local roads and streets. The soil is a probable source of sand and gravel.

In areas used for corn, soybeans, or small grain, erosion is a hazard and the moderate available water capacity is a limitation. A conservation tillage system that leaves crop residue on the surface and field windbreaks help to control erosion and conserve moisture. Irrigation can help to compensate for the moderate available water capacity. Tillage when the soil is wet causes surface compaction and cloddiness and excessive runoff and erosion. Adding organic material minimizes crusting and improves tilth and fertility.

In areas used for pasture or hay, erosion is a hazard and the moderate available water capacity is a limitation. Overgrazing reduces forage yields and causes surface compaction and excessive runoff and erosion. Timely deferment of grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and minimize erosion. Planting drought-resistant grasses and legumes helps to establish a plant cover. Irrigation helps to maintain the quality of the plants.

In areas used as woodland, the moderate available water capacity is a limitation. Planting in furrows, mulching, and selecting seedlings that can withstand dry conditions reduce the seedling mortality rate and help to control plant competition.

If this soil is used as a site for septic tank absorption fields, a poor filtering capacity and the slope are limitations. The poor filtering capacity can result in pollution of the ground water by the effluent. Replacing the soil with several feet of suitable loamy material improves the filtering capacity. An alternative is a system that includes a sealed sand filter and a disinfection tank. Installing the filter field lines on the contour and cutting, filling, and land shaping help to overcome the slope.

If this soil is used as a site for local roads and streets, the slope is a limitation. Cutting, filling, and land shaping help to overcome this limitation.

The land capability classification is IVe.

329—Will loam. This nearly level, poorly drained soil is on terraces. It is ponded for brief periods in spring. Individual areas range from 5 to 25 acres in size.

Typically, the surface layer is black, friable loam about 20 inches thick. The subsoil is dark gray, friable loam about 6 inches thick. The underlying material to a depth of about 60 inches is dark gray, mottled, loose, calcareous gravelly loamy sand. In some areas the underlying material is closer to the surface. In other areas carbonates are farther from the surface.

Included with this soil in mapping are small areas of the poorly drained Harpster and Palms soils. These soils are in nearly level areas. Harpster soils contain less sand than the Will soil. Palms soils formed in organic material. Included soils make up 5 to 15 percent of the unit.

Water and air move through the upper part of the Will soil at a moderate rate and through the lower part at a rapid rate. Surface runoff is very slow or ponded. The seasonal high water table is 0.5 foot above to 2.0 feet below the surface during the wettest periods of the year. Available water capacity is moderate. Organic matter content is high. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops and poorly suited to local roads and streets. It is generally unsuited to dwellings and septic tank absorption fields because of the ponding. The soil is a probable source of sand and gravel.

In areas used for corn, soybeans, or small grain, the ponding is a hazard and the seasonal high water table is a limitation. The wetness delays planting or interferes with harvesting in many years. Surface ditches, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available. The wetness of this soil has been sufficiently reduced by a drainage system for production of the crops commonly grown in the county. Measures that maintain or improve the drainage system are needed. Tillage when the soil is wet causes surface compaction and cloddiness. Adding organic material helps to maintain or improve tilth and fertility.

If this soil is used as a site for local roads and streets, the ponding is a hazard and the seasonal high water table and low strength are limitations. Constructing open ditches, which remove excess water, and raising the roadbed with suitable fill material reduce the wetness and the hazard of ponding. Strengthening or replacing the base material helps to prevent the damage caused by low strength.

The land capability classification is IIw.

347—Canisteo loam. This nearly level, poorly drained soil is on terraces. It is ponded for brief periods in spring. Individual areas range from 10 to 90 acres in size.

Typically, the surface layer is black, friable, calcareous loam about 17 inches thick. The subsoil is dark grayish brown, mottled, friable, calcareous loam about 24 inches thick. The underlying material to a depth of about 60 inches is light olive gray, mottled, friable, calcareous, stratified silt loam, loam, and sandy loam. In some areas carbonates are farther from the surface. In other areas the surface soil is thinner. In

some places the seasonal high water table is below a depth of 1 foot. In other places the entire solum contains less sand. In some areas the underlying material contains gravel.

Included with this soil in mapping are small areas of the excessively drained Plainfield and Sparta soils. These soils are on side slopes above the Canisteo soil. They make up 5 to 10 percent of the unit.

Water and air move through the Canisteo soil at a moderate rate. Surface runoff is slow. The seasonal high water table is 1 foot above to 1 foot below the surface during the wettest periods of the year. Available water capacity is high. Organic matter content also is high. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops. It is generally unsuited to dwellings and septic tank absorption fields because of the ponding. It is poorly suited to local roads and streets.

In areas used for corn, soybeans, or small grain, the ponding is a hazard and the seasonal high water table is a limitation. The wetness delays planting or interferes with harvesting in many years. Surface ditches, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available. The wetness of this soil has been sufficiently reduced by a drainage system for production of the crops commonly grown in the county. Measures that maintain or improve the drainage system are needed. Tillage when the soil is wet causes surface compaction and cloddiness. Adding organic material helps to maintain or improve tilth and fertility.

If this soil is used as a site for local roads and streets, the ponding is a hazard and low strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to prevent the damage caused by low strength and frost action. Constructing open ditches, which remove excess water, and raising the roadbed with suitable fill material reduce the wetness and the hazard of ponding.

The land capability classification is IIw.

379A—Dakota loam, 0 to 2 percent slopes. This nearly level, well drained soil is on terraces. Individual areas range from 10 to 220 acres in size.

Typically, the surface layer is very dark brown and very dark grayish brown, friable loam about 20 inches thick. The subsoil is about 18 inches thick. The upper part is dark brown, friable loam, and the lower part is dark yellowish brown, very friable sandy loam. The underlying material to a depth of about 60 inches is dark yellowish brown, very friable loamy sand. In some places, the surface soil is lighter colored and the sandy material is farther from the surface. In other places the upper part of the solum contains more sand.

Included with this soil in mapping are small areas of the somewhat poorly drained La Hogue and excessively drained Plainfield and Sparta soils. La Hogue soils are lower on the landscape than the Dakota soil. Sparta and Plainfield soils contain more sand than Dakota soil. They are adjacent to the Dakota soil. Included soils make up 10 to 15 percent of the unit.

Water and air move through the upper part of the Dakota soil at a moderate rate and through the lower part at a rapid rate. Surface runoff is slow. Available water capacity and organic matter content are moderate. The potential for frost action also is moderate.

Most areas are cultivated. This soil is moderately suited to cultivated crops, to pasture and hay, and to local roads and streets. It is well suited to dwellings and poorly suited to septic tank absorption fields. The soil is a probable source of sand and gravel.

In areas used for corn, soybeans, or small grain, the moderate available water capacity is a limitation. A conservation tillage system that leaves crop residue on the surface and field windbreaks conserve moisture. Irrigation can help to compensate for the moderate available water capacity. Tillage when the soil is wet causes surface compaction and cloddiness. Adding organic material helps to maintain or improve tilth and fertility.

In areas used for pasture or hay, the moderate available water capacity is a limitation. Planting drought-resistant grasses and legumes helps to establish a plant cover. Timely deferment of grazing, rotation grazing, applications of fertilizer, and irrigation help to maintain the quality of the plants.

If this soil is used as a site for septic tank absorption fields, a poor filtering capacity can result in pollution of the ground water by the effluent. Replacing the soil with several feet of suitable loamy material improves the filtering capacity. An alternative is a system that includes a sealed sand filter and a disinfection tank.

If this soil is used as a site for local roads and streets, low strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

The land capability classification is IIs.

379B—Dakota loam, 2 to 5 percent slopes. This gently sloping, well drained soil is on terraces. Individual areas range from 3 to 30 acres in size.

Typically, the surface layer is very dark grayish brown, friable loam about 10 inches thick. The subsoil is about 27 inches thick. The upper part is dark brown, friable loam; the next part is dark yellowish brown, friable clay loam, loam, and sandy clay loam; and the

lower part is dark brown, very friable loamy sand. The underlying material to a depth of about 60 inches is dark brown and loose. The upper part is coarse sand, and the lower part is loamy coarse sand. In some areas the subsoil has more clay. In other areas the sandy material is farther from the surface. In places, the surface soil is lighter colored and the sandy material is farther from the surface.

Included with this soil in mapping are small areas of the excessively drained Sparta soils. These soils are higher on the landscape than the Dakota soil. They make up 2 to 10 percent of the unit.

Water and air move through the upper part of the Dakota soil at a moderate rate and through the lower part at a rapid rate. Surface runoff is medium. Available water capacity and organic matter content are moderate. The potential for frost action also is moderate.

Most areas are cultivated. This soil is moderately suited to cultivated crops, to pasture and hay, and to local roads and streets. It is well suited to dwellings and poorly suited to septic tank absorption fields. The soil is a probable source of sand and gravel.

In areas used for corn, soybeans, or small grain, erosion is a hazard and the moderate available water capacity is a limitation. A conservation tillage system that leaves crop residue on the surface and field windbreaks help to control erosion and conserve moisture. Irrigation can help to compensate for the moderate available water capacity. Tillage when the soil is wet causes surface compaction and cloddiness and excessive runoff and erosion. Adding organic material helps to maintain or improve tilth and fertility.

In areas used for pasture or hay, erosion is a hazard and the moderate available water capacity is a limitation. Overgrazing reduces forage yields and causes surface compaction and excessive runoff and erosion. Timely deferment of grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and minimize erosion. Planting drought-resistant grasses and legumes helps to establish a plant cover. Irrigation helps to maintain the quality of the plants.

If this soil is used as a site for septic tank absorption fields, a poor filtering capacity can result in pollution of the ground water by the effluent. Replacing the soil with several feet of suitable loamy material improves the filtering capacity. An alternative is a system that includes a sealed sand filter and a disinfection tank.

If this soil is used as a site for local roads and streets, low strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

The land capability classification is IIe.

386B—Downs silt loam, 1 to 5 percent slopes. This gently sloping, moderately well drained soil is on uplands. Individual areas range from 5 to 145 acres in size.

Typically, the surface layer is very dark grayish brown, friable silt loam about 7 inches thick. The subsurface layer is grayish brown, friable silt loam about 5 inches thick. The subsoil is about 38 inches thick. The upper part is brown, friable silt loam; the next part is brown and dark yellowish brown, friable silty clay loam; and the lower part is dark brown, mottled, friable silty clay loam. The underlying material to a depth of about 60 inches is yellowish brown, mottled, friable silt loam. In some places the surface layer is thicker. In other places depth to the seasonal high water table is less than 4 feet. In some areas the surface layer is thinner and lighter colored. In other areas slopes are less than 1 percent.

Included with this soil in mapping are small areas of the moderately well drained Birkbeck and Catlin and well drained Miami soils. Birkbeck and Catlin soils formed in loess and in the underlying glacial till. They are on the lower side slopes. Miami soils formed in glacial till. They are on side slopes. Included soils make up 5 to 15 percent of the unit.

Water and air move through the Downs soil at a moderate rate. Surface runoff is medium. The seasonal high water table is 4 to 6 feet below the surface during the wettest periods of the year. Available water capacity is high. Organic matter content is moderate. The shrink-swell potential also is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, and to woodland. It is moderately suited to dwellings and septic tank absorption fields. It is poorly suited to local roads and streets.

In areas used for corn, soybeans, or small grain, erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, contour farming, and stripcropping help to control erosion. Tillage when the soil is wet causes surface compaction and cloddiness and excessive runoff and erosion. Adding organic material helps to maintain or improve tilth and fertility.

In areas used for pasture or hay, erosion is a hazard. Overgrazing reduces forage yields and causes surface compaction and excessive runoff and erosion. Timely deferment of grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and minimize erosion.

If this soil is used as a site for dwellings, the shrink-swell potential is a limitation. The seasonal high water

table also is a limitation on sites for dwellings with basements. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling. Installing tile drains around the footings helps to lower the water table.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table is a limitation. Installing tile drains around the perimeter of the filter field helps to lower the water table.

If this soil is used as a site for local roads and streets, low strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

The land capability classification is IIe.

387A—Ockley sandy loam, 0 to 2 percent slopes. This nearly level, well drained soil is on terraces. Individual areas range from 4 to 110 acres in size.

Typically, the surface layer is brown, friable sandy loam about 11 inches thick. The subsurface layer is brown, friable fine sandy loam about 7 inches thick. The subsoil is about 22 inches thick. It is friable. The upper part is dark yellowish brown loam and clay loam, and the lower part is dark brown gravelly clay loam. The underlying material to a depth of about 60 inches is brown, loose, calcareous extremely gravelly loamy sand. In some places the surface soil is darker. In other places depth to the underlying material is less than 40 inches. In some areas the subsoil contains less clay or less sand.

Included with this soil in mapping are small areas of the well drained Ross soils. These soils are frequently flooded and are on the lower parts of the landscape. They make up 2 to 5 percent of the unit.

Water and air move through the upper part of the Ockley soil at a moderate rate and through the lower part at a very rapid rate. Surface runoff is slow. Available water capacity is high. Organic matter content is moderate. The shrink-swell potential and the potential for frost action also are moderate.

Most areas are cultivated. This soil is well suited to cultivated crops, pasture and hay, woodland, and septic tank absorption fields. It is moderately suited to dwellings and to local roads and streets. The soil is a probable source of sand and gravel.

No major limitations affect the use of this soil for corn, soybeans, or small grain. Tillage when the soil is wet causes surface compaction and cloddiness. Adding organic material minimizes crusting and improves tilth and fertility.

If this soil is used as a site for dwellings, the shrink-swell potential is a limitation. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for local roads and streets, low strength, the potential for frost action, and the shrink-swell potential are limitations. Strengthening or replacing the base material helps to overcome these limitations.

The land capability classification is I.

439—Jasper loam, sandy substratum. This nearly level, well drained soil is on terraces. Individual areas range from 5 to 395 acres in size.

Typically, the surface layer is very dark grayish brown, friable loam about 8 inches thick. The subsurface layer is very dark grayish brown and dark brown, friable loam about 10 inches thick. The subsoil is about 28 inches thick. It is friable. The upper part is dark brown clay loam, the next part is dark yellowish brown loam, and the lower part is brown loam. The underlying material to a depth of about 60 inches is brown, very friable loamy sand and sand. In some areas the surface layer is thicker. In other areas it is thinner. In some places the subsoil is thinner. In other places it has more sand.

Included with this soil in mapping are small areas of the somewhat poorly drained La Hogue, well drained Onarga, and poorly drained Selma soils. La Hogue and Selma soils are in shallow depressions below the Jasper soil. Onarga soils contain more sand than the Jasper soil. They are on side slopes above the Jasper soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the upper part of the Jasper soil at a moderate rate and through the lower part at a rapid rate. Surface runoff is slow. Available water capacity is high. Organic matter content is moderate. The potential for frost action also is moderate.

Most areas are cultivated. This soil is well suited to cultivated crops, to dwellings, and to septic tank absorption fields. It is moderately suited to local roads and streets. The soil is a probable source of sand.

No major limitations affect the use of this soil for corn, soybeans, or small grain. Tillage when the soil is wet causes surface compaction and cloddiness. Adding organic material helps to maintain or improve tilth and fertility.

If this soil is used as a site for local roads and streets, low strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

The land capability classification is I.

447—Canisteo loam, sandy substratum. This nearly level, poorly drained, calcareous soil is in low areas on stream terraces. It is ponded for brief periods in spring.

It occurs as one area on the boundary between Tazewell County and Mason County.

Typically, the surface layer is black, friable loam about 10 inches thick. The subsurface layer is very dark gray, friable loam about 4 inches thick. The subsoil is about 34 inches thick. It is mottled and friable. In sequence downward, it is dark gray loam, gray and grayish brown clay loam, light gray loam, and dark grayish brown sandy loam. The underlying material to a depth of about 60 inches is brown, mottled, loose sand. In some areas the soil contains less sand. In a few places the underlying material contains more clay.

Included with this soil in mapping are small areas of the very poorly drained Palms, somewhat poorly drained Ridgeville, and poorly drained Selma soils. These soils are not calcareous. Palms soils are organic. They are lower on the landscape than the Canisteo soil. Ridgeville soils are on slight rises above the Canisteo soil. Selma soils are in landscape positions similar to those of the Canisteo soil. Included soils make up 1 to 5 percent of the unit.

Water and air move through the upper part of the Canisteo soil at a moderate rate and through the lower part at a rapid rate. Surface runoff is slow to ponded. The seasonal high water table is 1 foot above to 1 foot below the surface in spring. Available water capacity is high. Organic matter content also is high. The surface layer may become compact and cloddy if it is tilled when too wet.

Most areas are cultivated. This soil is well suited to cultivated crops. It is generally unsuited to dwellings and septic tank absorption fields because of the ponding. It is poorly suited to local roads and streets.

The wetness of this soil has been sufficiently reduced by a drainage system for the production of corn, soybeans, and small grain. Measures that maintain or improve the drainage system are needed. Surface drains, subsurface tile, and surface inlet tile generally function satisfactorily if suitable outlets are available. No applications of lime are needed. Minimizing tillage and returning crop residue to the soil improve tilth, minimize surface compaction and crusting, increase the rate of water infiltration, and maintain productivity.

If this soil is used as a site for local roads and streets, the ponding is a hazard and low strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to prevent the damage caused by low strength and frost action. Constructing open ditches, which remove excess water, and raising the roadbed with suitable fill material reduce the hazard of ponding.

The land capability classification is IIw.

533—Urban land. This map unit occurs mainly as areas covered by pavement, railroad tracks, and buildings. Because of extensive land smoothing, it generally is nearly level or gently sloping. Most of the areas are near the Illinois River in East Peoria, Creve Coeur, and Pekin. Some are industrial areas in Morton or commercial areas in Washington. Individual areas range from 10 to 450 acres in size.

More than 85 percent of this map unit is covered by buildings and pavement. Most of the paved areas are parking lots adjacent to shopping centers, industrial plants, and other commercial buildings. The soils have been so extensively modified by cutting and filling that the soil series cannot be identified.

Included with the Urban land in mapping are small areas of Jules, Onarga, and Stronghurst soils. The moderately well drained Jules soils are near the Illinois River. The moderately well drained Onarga soils are on small ridges. The somewhat poorly drained Stronghurst soils are in slight depressions and in drainageways. Included soils make up less than 15 percent of the unit.

Runoff generally is very rapid on the Urban land. Because of the design of most paved areas, the water commonly is diverted into storm drainage systems. In some areas, however, it is diverted onto the adjacent soils. The additional water causes erosion on these soils and causes flooding in some areas.

This map unit is not assigned a land capability classification.

684B—Broadwell silt loam, 1 to 5 percent slopes. This gently sloping, well drained soil is on uplands. Individual areas range from 5 to 165 acres in size.

Typically, the surface layer is very dark grayish brown, friable silt loam about 7 inches thick. The subsurface layer is very dark grayish brown and dark brown, friable silt loam about 6 inches thick. The subsoil is about 35 inches thick. The upper part is yellowish brown, firm silty clay loam; the next part is yellowish brown, friable silt loam; and the lower part is strong brown, very friable loamy fine sand. The underlying material to a depth of about 60 inches is strong brown, loose loamy fine sand. In places depth to the underlying material is more than 60 inches or less than 40 inches. In some areas the underlying material contains less sand and is calcareous.

Included with this soil in mapping are small areas of the somewhat poorly drained Ipava and poorly drained Sable soils. These soils are on the lower parts of the landscape. They make up 2 to 10 percent of the unit.

Water and air move through the upper part of the Broadwell soil at a moderate rate and through the lower part at a rapid rate. Surface runoff is medium. Available water capacity is high. Organic matter content also is

high. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, and to septic tank absorption fields. It is moderately suited to dwellings and poorly suited to local roads and streets. The soil is a probable source of sand.

In areas used for corn, soybeans, or small grain, erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, contour farming, and stripcropping help to control erosion. Tillage when the soil is wet causes surface compaction and cloddiness and excessive runoff and erosion. Adding organic material helps to maintain or improve tilth and fertility.

In areas used for pasture or hay, erosion is a hazard. Overgrazing reduces forage yields and causes surface compaction and excessive runoff and erosion. Timely deferment of grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and minimize erosion.

If this soil is used as a site for dwellings, the shrink-swell potential is a limitation. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for local roads and streets, low strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

The land capability classification is IIe.

684C2—Broadwell silt loam, 5 to 10 percent slopes, eroded. This sloping, well drained soil is on uplands. Individual areas range from 3 to 45 acres in size.

Typically, the surface layer is mixed very dark grayish brown and dark yellowish brown, friable silt loam about 8 inches thick. The subsoil is about 41 inches thick. It is yellowish brown. The upper part is firm silty clay loam; the next part is mottled, friable silt loam; and the lower part is friable sandy loam. The underlying material to a depth of about 60 inches is yellowish brown, very friable loamy sand. In places depth to the underlying material is more than 60 inches or less than 40 inches. In some areas the underlying material contains less sand.

Included with this soil in mapping are small areas of the somewhat poorly drained Ipava and poorly drained Sable soils. These soils are in drainageways on the lower parts of the landscape. They make up 2 to 5 percent of the unit.

Water and air move through the upper part of the Broadwell soil at a moderate rate and through the lower part at a rapid rate. Surface runoff is medium. Available water capacity is high. Organic matter content is moderate. The shrink-swell potential also is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is moderately suited to cultivated crops and to dwellings. It is well suited to pasture and hay and to septic tank absorption fields. It is poorly suited to local roads and streets. The soil is a probable source of sand.

In areas used for corn, soybeans, or small grain, erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, contour farming, and stripcropping help to control erosion. Tillage when the soil is wet causes surface compaction and cloddiness and excessive runoff and erosion. Adding organic material helps to maintain or improve tilth and fertility.

In areas used for pasture or hay, erosion is a hazard. Overgrazing reduces forage yields and causes surface compaction and excessive runoff and erosion. Timely deferment of grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and minimize erosion.

If this soil is used as a site for dwellings, the shrink-swell potential is a limitation. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for local roads and streets, low strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

The land capability classification is IIIe.

689B—Coloma sand, 3 to 7 percent slopes. This gently sloping, excessively drained soil is on terraces. Individual areas range from 5 to 60 acres in size.

Typically, the surface layer is brown, very friable sand about 6 inches thick. The subsurface layer is very friable sand about 34 inches thick. The upper part is dark yellowish brown, and the lower part is yellowish brown. The subsoil is about 20 inches thick. It is light yellowish brown, loose sand that has lamellae of brown, very friable loamy sand. In some areas the surface layer is darker and thicker. In other areas the subsoil has more clay. In places the depth to lamellae of sandy loam or loamy sand is more than 60 inches.

Included with this soil in mapping are small areas of the somewhat excessively drained Disco, well drained Onarga, and somewhat poorly drained Selma soils. Disco soils are in nearly level areas below the Coloma soil. Onarga soils are in the less sloping areas below

the Coloma soil. Selma soils are in nearly level areas or depressions below the Coloma soil. Included soils make up 5 to 10 percent of the unit.

Water and air move through the Coloma soil at a rapid rate. Surface runoff is slow. Available water capacity is low. Organic matter content also is low.

Most areas are cultivated. This soil is poorly suited to cultivated crops, to pasture and hay, and to septic tank absorption fields. It is moderately suited to woodland and well suited to dwellings and to local roads and streets. The soil is a probable source of sand.

In areas used for corn, soybeans, or small grain, erosion and soil blowing are hazards and the low available water capacity is a limitation. A conservation tillage system that leaves crop residue on the surface and field windbreaks help to control erosion and soil blowing and conserve moisture. Irrigation can help to compensate for the low available water capacity. Tillage when the soil is wet causes surface compaction and cloddiness and excessive runoff and erosion. Adding organic material increases the available water capacity and improves fertility.

In areas used for pasture or hay, erosion and soil blowing are hazards and the low available water capacity is a limitation. Overgrazing reduces forage yields and causes surface compaction and excessive runoff and erosion. Timely deferment of grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and minimize erosion. Bare spots, thin stands of plants, and recently planted areas are subject to soil blowing. Maintaining a thick, healthy plant cover minimizes soil blowing. Planting drought-resistant grasses and legumes helps to establish a plant cover. Irrigation helps to maintain the quality of the plants.

In areas used as woodland, the low available water capacity is a limitation. Planting in furrows, mulching, and selecting seedlings that can withstand dry conditions reduce the seedling mortality rate and help to control plant competition.

If this soil is used as a site for septic tank absorption fields, a poor filtering capacity can result in pollution of the ground water by the effluent. Replacing the soil with several feet of suitable loamy material improves the filtering capacity. An alternative is a system that includes a sealed sand filter and a disinfection tank.

The land capability classification is IVs.

802—Orthents, loamy. These moderately well drained and somewhat poorly drained, moderately fine textured to moderately coarse textured soils are in landfills, in interstate highway cloverleafs, in surface mines, on construction equipment grounds, and in other areas that have been modified by filling and leveling. In most areas they are nearly level or gently sloping. In a few areas near interstate cloverleafs, however, they are sloping or strongly sloping. Individual areas range from 10 to more than 420 acres in size.

A typical area is one where the loamy material has been deposited, removed, or shaped. Soil borings indicate that the soil material varies widely and does not occur in a consistent pattern.

Included with these soils in mapping are highway interchanges, gravel pits, and some urban areas where concrete, asphalt, buildings, streets, and parking lots cover as much as 65 percent of the surface.

Available water capacity in the Orthents varies but generally is high. Permeability generally is moderate in the surface layer and slow in the underlying material, but it varies because the soils have been compacted by construction equipment and because the texture varies. The content of organic matter and of plant nutrients generally is low.

Most areas are idle or are developed for residential or other nonfarm uses. Unless a good plant cover protects the surface, erosion is a severe hazard. It is especially severe in the more sloping areas. In severely eroded areas, special management is needed to establish and maintain a plant cover that controls runoff and erosion. Some areas support no vegetation, and some developed areas have a good cover of sod. Onsite investigation is needed to determine the limitations or hazards affecting the development of specific areas for urban uses.

This map unit is not assigned a land capability classification.

865—Pits, gravel. This map unit consists of open excavations from which sand and gravel have been or are being removed and the piles of sand and gravel or other spoil material surrounding the excavations. Most of the pits are on terraces near the Mackinaw River. Individual areas range from 3 to 100 acres in size.

The excavations are commonly 10 to 30 feet deep. Typically, the soil material is loamy or sandy and has been mixed or compacted during excavation. In some areas silty surface soil and subsoil material has been mixed with the sandier underlying material. In some of the pits, the soil material supports vegetation, such as trees, shrubs, weeds, and grasses.

Included in mapping are perennial or intermittent water areas smaller than 1 acre and small areas of Orthents, loamy, adjacent to the pits. Included areas make up 10 to 15 percent of the unit.

Areas of this unit are idle unless they are currently being excavated. Without major reclamation, the pits are generally unsuited to farming and building site development. Some areas are a good source of sand

and gravel. Some are well suited to recreational activities, such as hiking, camping, and fishing. Special site preparation, such as land smoothing and leveling and topdressing with surface soil material, may be needed to establish vegetation. The feasibility of reclamation depends on the conditions at the site and the proposed alternative use.

This map unit is not assigned a land capability classification.

935F—Miami-Hennepin complex, 20 to 35 percent slopes. These steep, well drained soils are on uplands. Individual areas range from 5 to 60 acres in size. They are 45 to 55 percent Miami soil and 20 to 30 percent Hennepin soil. The two soils occur as areas so intricately mixed or so small that mapping them separately is not practical.

Typically, the surface layer of the Miami soil is dark brown, friable silt loam about 6 inches thick. The subsurface layer is dark brown, friable loam about 9 inches thick. The subsoil is about 21 inches thick. The upper part is brown silt loam, the next part is dark yellowish brown clay loam, and the lower part is yellowish brown loam. The underlying material to a depth of about 60 inches is yellowish brown, calcareous loam. In some places carbonates and the seasonal high water table are closer to the surface. In other places glacial till is farther from the surface. In some areas the surface layer is darker. In other areas slopes are less than 20 percent. In places carbonates are farther from the surface.

Typically, the surface layer of the Hennepin soil is very dark brown, friable loam about 6 inches thick. The subsoil is brown, firm loam about 9 inches thick. It is calcareous in the lower part. The underlying material to a depth of about 60 inches is yellowish brown, firm, calcareous loam. In some places outwash is on the surface. In other places, the subsoil is thicker and the content of clay is higher. In some areas carbonates are farther from the surface. In other areas glacial till is farther from the surface. In places slopes are less than 20 percent.

Included with these soils in mapping are small areas of the moderately well drained Birkbeck, well drained Fayette, and poorly drained Sawmill soils. Birkbeck soils are deeper to glacial till than the Miami and Hennepin soils. They are adjacent to the Miami and Hennepin soils. Fayette soils do not have glacial till in the subsoil. They are on side slopes above the Miami and Hennepin soils. Sawmill soils are in drainageways and on flood plains. Included soils make up 15 to 35 percent of the unit.

Water and air move through the upper part of the Miami soil at a moderate rate and through the lower part at a moderately slow rate. They move through the Hennepin soil at a moderately slow rate. Surface runoff is very rapid on both soils. Available water capacity is high. Organic matter content is moderately low. The shrink-swell potential is moderate. The potential for frost action is moderate in the Miami soil.

Most areas are wooded. These soils are moderately suited to woodland and poorly suited to pasture and hay. They are generally unsuited to cultivated crops, to dwellings, and to local roads and streets because of the slope. They are generally unsuited to septic tank absorption fields because of the moderately slow permeability and the slope.

In areas used for pasture or hay, erosion is a hazard and the slope is a limitation. Overgrazing reduces forage yields and causes surface compaction and excessive runoff and erosion. Timely deferment of grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and minimize erosion. Special equipment and techniques are needed when seeds are planted and chemicals and fertilizer are applied. The steepest areas are unsuitable for hay because the slope limits the use of harvesting equipment.

In the areas used as woodland, erosion is a hazard and the slope is a limitation. Building logging roads and skid trails on or nearly on the contour and diverting surface water help to control erosion. Limiting logging activities to periods when the soils are dry or frozen helps to prevent excessive rutting and erosion. Seeding all bare areas to grasses or a grass-legume mixture after logging has been completed helps to control erosion. In the steeper areas the logs should be skidded uphill with a cable and winch.

The land capability classification is VIe.

935G—Miami-Hennepin complex, 30 to 60 percent slopes. These very steep, well drained soils are on uplands. Individual areas range from 5 to 100 acres in size. They are 45 to 55 percent Miami soil and 20 to 30 percent Hennepin soil. The two soils occur as areas so intricately mixed or so small that mapping them separately is not practical.

Typically, the surface layer of the Miami soil is dark brown, friable loam about 4 inches thick. The subsurface layer is about 7 inches of yellowish brown, friable silt loam and loam. The subsoil is friable loam about 28 inches thick. The upper part is yellowish brown, and the lower part is yellowish brown and dark yellowish brown. The underlying material to a depth of about 60 inches is yellowish brown, friable, calcareous loam. In some places carbonates and the seasonal high water table are closer to the surface. In other places glacial till is farther from the surface. In some areas the

surface layer is darker. In other areas slopes are more than 60 percent. In places carbonates are farther from the surface.

Typically, the surface layer of the Hennepin soil is very dark grayish brown, friable loam about 5 inches thick. The subsoil is friable, calcareous loam about 11 inches thick. The upper part is brown, and the lower part is yellowish brown. The underlying material to a depth of about 60 inches is yellowish brown, friable, calcareous loam. In some places outwash is on the surface. In other places, the subsoil is thicker and the content of clay is higher. In some areas carbonates are farther from the surface. In other areas glacial till is farther from the surface. In places slopes are more than 60 percent.

Included with these soils in mapping are small areas of the moderately well drained Birkbeck, well drained Sylvan, and poorly drained Sawmill soils. Birkbeck soils are deeper to glacial till than the Miami and Hennepin soils. They are adjacent to the Miami and Hennepin soils. Sawmill soils are in drainageways and on flood plains. Sylvan soils do not have glacial till in the subsoil. They are on side slopes above the Miami and Hennepin soils. They make up 15 to 25 percent of the unit.

Water and air move through the upper part of the Miami soil at a moderate rate and through the lower part at a moderately slow rate. They move through the Hennepin soil at a moderately slow rate. Surface runoff is very rapid on both soils. Available water capacity is high. Organic matter content is moderately low. The shrink-swell potential is moderate. The potential for frost action is moderate in the Miami soil.

Most areas are wooded. These soils are poorly suited to woodland. They are generally unsuited to cultivated crops, pasture and hay, dwellings, septic tank absorption fields, and local roads and streets because of the slope.

In the areas used as woodland, erosion is a hazard and the slope is a limitation. Building logging roads and skid trails on or nearly on the contour and diverting surface water help to control erosion. Limiting logging activities to periods when the soils are dry or frozen helps to prevent excessive rutting and erosion. Seeding all bare areas to grasses or a grass-legume mixture after logging has been completed helps to control erosion. In the steeper areas the logs should be skidded uphill with a cable and winch.

The land capability classification is VIIe.

2043—Ipava-Urban land complex. This nearly level map unit occurs as areas of a somewhat poorly drained Ipava soil intermingled with areas of Urban land. The unit is on uplands. Individual areas range from 5 to 320 acres in size. They are 40 to 50 percent Ipava soil and 30 to 50 percent Urban land. The Ipava soil and Urban land occur as areas so intricately mixed or so small that mapping them separately is not practical.

Typically, the surface soil of the Ipava soil is friable silt loam about 11 inches thick. The upper part is very dark gray, and the lower part is black. The subsoil is about 42 inches thick. It is mottled. The upper part is dark grayish brown and grayish brown, firm silty clay loam; the next part is light brownish gray, firm silty clay loam; and the lower part is light brownish gray, friable silt loam. The underlying material to a depth of about 60 inches is mottled light brownish gray and yellowish brown, friable silt loam. In some places the surface soil is thinner. In other places the underlying material is calcareous loam. In some areas the seasonal high water table is below a depth of 3 feet. Some of the low areas have been filled or leveled during construction. Other small areas have been cut, built up, or smoothed.

The Urban land is covered by streets, parking lots, buildings, and other structures. The soils are so obscured or modified that the soil series cannot be identified.

Included with the Ipava soil in mapping are small areas of the moderately well drained Birkbeck and Broadwell and poorly drained Denny soils. Birkbeck soils have glacial till in the underlying material. They are on the more sloping parts of the landscape. Broadwell soils have sandy underlying material. They are on slight rises above the Ipava soil. Denny soils contain more clay than the Ipava soil. They are on the lower parts of the landscape. Included soils make up 10 to 25 percent of the unit.

In most areas excess water is drained through storm sewers, gutters, drainage tile, and surface ditches. Unless drained, the Ipava soil has a seasonal high water table at a depth of 1 to 3 feet during the wettest periods of the year. Water and air move through this soil at a moderately slow rate. Surface runoff is slow. Available water capacity is very high. Organic matter content is high. The shrink-swell potential and the potential for frost action also are high.

The Ipava soil is used for parks, building site development, and lawns and gardens. It is moderately suited to lawns and landscaping, vegetable and flower gardens, ornamental trees and shrubs, and recreational uses. It is poorly suited to dwellings, septic tank absorption fields, and local roads and streets.

If the Ipava soil is used as a site for dwellings, the seasonal high water table and the shrink-swell potential are limitations. Installing tile drains around the footings helps to lower the water table. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

If the Ipava soil is used as a site for septic tank absorption fields, the seasonal high water table and the restricted permeability are limitations. Installing tile drains around the perimeter of the filter field helps to lower the water table. Grading and land shaping help to divert surface water from the filter field. Increasing the size of the filter field or replacing the soil with material that is more permeable helps to overcome the restricted permeability.

If the Ipava soil is used as a site for local roads and streets, low strength, the potential for frost action, and the shrink-swell potential are limitations. Strengthening or replacing the base material helps to overcome these limitations.

This map unit is not assigned a land capability classification.

2068—Sable-Urban land complex. This nearly level map unit occurs as areas of a poorly drained Sable soil intermingled with areas of Urban land. The unit is on uplands. Individual areas range from 5 to 105 acres in size. They are 40 to 60 percent Sable soil and 30 to 40 percent Urban land. The Sable soil and Urban land occur as areas so intricately mixed or so small that mapping them separately is not practical.

Typically, the surface layer of the Sable soil is very dark gray and brown, firm silty clay loam about 6 inches thick. The subsurface layer is black, firm silty clay loam about 15 inches thick. The subsoil is firm silty clay loam about 32 inches thick. The upper part is dark grayish brown, the next part is grayish brown, and the lower part is olive gray. The underlying material to a depth of about 60 inches is olive gray, mottled, friable silt loam. In some places the seasonal high water table is below a depth of 2 feet. In other places the underlying material is calcareous. Some of the lower areas have been filled or leveled during construction. Other small areas have been cut, built up, or smoothed.

The Urban land is covered by streets, parking lots, buildings, and other structures. The soils are so obscured or modified that the soil series cannot be identified.

Included with the Sable soil in mapping are small areas of the moderately well drained Plano and Tama soils. These soils are on knobs and rises above the Sable soil. They make up 10 to 25 percent of the unit.

In most areas excess water is drained through storm sewers, gutters, drainage tile, and surface ditches. Unless drained, the Sable soil has a seasonal high water table that is 0.5 foot above to 2.0 feet below the surface during the wettest periods of the year. Water and air move through this soil at a moderate rate. Surface runoff is slow to ponded. Available water capacity is very high. Organic matter content is high. The shrink-swell potential is moderate, and the potential for frost action is high.

The Sable soil is used for parks, building site development, and lawns and gardens. It is poorly suited to lawns and landscaping, vegetable and flower gardens, ornamental trees and shrubs, and recreational uses. It is generally unsuited to dwellings and septic tank absorption fields because of the ponding. It is poorly suited to local roads and streets.

If the Sable soil is used as a site for local roads and streets, the ponding is a hazard and low strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to prevent the damage caused by low strength and frost action. Constructing open ditches, which remove excess water, and raising the roadbed with suitable fill material reduce the hazard of ponding.

This map unit is not assigned a land capability classification.

2088B—Sparta-Urban land complex, 1 to 7 percent slopes. This gently sloping map unit occurs as areas of an excessively drained Sparta soil intermingled with areas of Urban land. The unit is on terraces. Individual areas range from 20 to 170 acres in size. They are 35 to 50 percent Sparta soil and 40 to 60 percent Urban land. The Sparta soil and Urban land occur as areas so intricately mixed that mapping them separately is not practical.

Typically, the surface layer of the Sparta soil is black, friable sandy loam about 11 inches thick. The subsurface layer is dark brown, very friable loamy sand about 9 inches thick. The subsoil is brown, very friable sand about 14 inches thick. The underlying material to a depth of about 60 inches is loose sand. The upper part is dark yellowish brown, and the lower part is yellowish brown. In some places the subsurface layer is thicker. In other places the surface layer is lighter colored. In some areas the subsoil has more clay. In other areas the underlying material contains gravel. In places the surface layer is mixed with cinders, concrete, or brick.

The Urban land is covered by streets, parking lots, buildings, and other structures. The soils are so obscured or modified that the soil series cannot be identified.

Included with the Sparta soil in mapping are small areas of the well drained Dakota and Jasper and poorly drained Orio soils. Jasper and Dakota soils contain more clay than the Sparta soil. They are on the lower parts of the landscape. Orio soils are in shallow depressions. Included soils make up 5 to 10 percent of the unit.

Water and air move through the Sparta soil at a rapid rate. Surface runoff is slow. Available water capacity is

low. Organic matter content is moderately low.

The Sparta soil is used for parks, building site development, and lawns and gardens. It is moderately suited to lawns, vegetable and flower gardens, and ornamental trees and shrubs. It is well suited to dwellings and to local roads and streets. It is poorly suited to septic tank absorption fields.

If the Sparta soil is used as a site for septic tank absorption fields, a poor filtering capacity can result in pollution of the ground water by the effluent. Replacing the soil with several feet of suitable loamy material improves the filtering capacity. An alternative is a system that includes a sealed sand filter and a disinfection tank.

This map unit is not assigned a land capability classification.

2266B—Disco-Urban land complex, 1 to 5 percent slopes. This gently sloping map unit occurs as one area of a well drained Disco soil intermingled with Urban land. The unit is on terraces. The area is 1,500 acres in size. It is 35 to 50 percent Disco soil and 40 to 60 percent Urban land. The Disco soil and Urban land occur as areas so intricately mixed or so small that mapping them separately is not practical.

Typically, the surface layer of the Disco soil is very dark gray, friable loam about 10 inches thick. The subsurface layer is very dark grayish brown, friable sandy loam about 13 inches thick. The subsoil is about 22 inches thick. It is friable. The upper part is dark brown sandy loam, and the lower part is dark yellowish brown loamy sand. The underlying material extends to a depth of about 60 inches. The upper part is dark yellowish brown, loose loamy sand, and the lower part is strong brown, stratified, loose loamy sand and sandy loam.

The Urban land is covered by streets, parking lots, buildings, and other structures. The soils are so obscured or modified that the soil series cannot be identified.

Included with the Disco soil in mapping are small areas of the somewhat poorly drained La Hogue and poorly drained Orio and Selma soils. La Hogue soils are in shallow depressions and drainageways below the Disco soil. Selma and Orio soils are on broad flats below the Disco soil. Included soils make up 5 to 10 percent of the unit.

Water and air move through the upper part of the Disco soil at a moderately rapid rate and through the lower part at a rapid rate. Surface runoff is medium on the Disco soil and rapid on the Urban land. Available water capacity, organic matter content, and the potential for frost action are moderate in the Disco soil.

The Disco soil is used for parks, building site development, and lawns and gardens. It is moderately suited to lawns and landscaping, vegetable and flower gardens, ornamental trees and shrubs, and recreational uses. It is well suited to dwellings and moderately suited to local roads and streets. It is poorly suited to septic tank absorption fields.

If the Disco soil is used as a site for septic tank absorption fields, a poor filtering capacity can result in pollution of the ground water by the effluent. Replacing the soil with several feet of suitable loamy material improves the filtering capacity. An alternative is a system that includes a sealed sand filter and a disinfection tank.

If the Disco soil is used as a site for local roads and streets, the potential for frost action is a limitation. Strengthening or replacing the base material helps to overcome this limitation.

This map unit is not assigned a land capability classification.

2278—Stronghurst-Urban land complex. This nearly level map unit occurs as areas of a somewhat poorly drained Stronghurst soil intermingled with areas of Urban land. The unit is on uplands. Individual areas range from 5 to 70 acres in size. They are 50 to 80 percent Stronghurst soil and 10 to 40 percent Urban land. The Stronghurst soil and Urban land occur as areas so intricately mixed or so small that mapping them separately is not practical.

Typically, the surface layer of the Stronghurst soil is dark grayish brown, friable silt loam about 3 inches thick. The subsurface layer is dark grayish brown, friable silt loam about 4 inches thick. The subsoil is friable silty clay loam about 43 inches thick. The upper part is brown, and the lower part is pale brown. The underlying material to a depth of about 60 inches is pale brown, friable silt loam. In some places the surface layer is darker. In other places, the loess is thinner and glacial till or outwash is within a depth of 60 inches. In some areas depth to the seasonal high water table is more than 4 feet or less than 1 foot. In other areas cinders are mixed into the surface layer. Some small areas have been cut and filled.

The Urban land is covered by streets, parking lots, buildings, and other structures. The soils are so obscured that the soil series cannot be identified.

Included with the Stronghurst soil in mapping are small areas of the moderately well drained Downs and poorly drained Sable soils. Downs soils are on the slightly higher parts of the landscape. Sable soils are in shallow depressions on the lower parts of the landscape. Included soils make up 5 to 10 percent of the unit.

Water and air move through the Stronghurst soil at a

moderate rate. Surface runoff is slow. The seasonal high water table is 1 to 3 feet below the surface during the wettest periods of the year. Available water capacity is high. Organic matter content is moderately low. The shrink-swell potential is moderate, and the potential for frost action is high.

The Stronghurst soil is used for parks, paths and trails, and lawns and gardens. It is well suited to lawns and gardens, ornamental trees and shrubs, and nature paths and trails. It is poorly suited to dwellings, septic tank absorption fields, and local roads and streets.

If the Stronghurst soil is used as a site for dwellings, the seasonal high water table is a limitation. Installing tile drains around the footings helps to lower the water table.

If the Stronghurst soil is used as a site for septic tank absorption fields, the seasonal high water table is a limitation. Installing tile drains around the perimeter of the filter field increases the depth to the water table. Grading and land shaping help to divert surface water from the filter field.

If the Stronghurst soil is used as a site for local roads and streets, low strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

This map unit is not assigned a land capability classification.

2279B—Rozetta-Urban land complex, 1 to 7 percent slopes. This gently sloping map unit occurs as areas of a moderately well drained Rozetta soil intermingled with areas of Urban land. The unit is on uplands. Individual areas range from 25 to 520 acres in size. They are 40 to 50 percent Rozetta soil and 30 to 50 percent Urban land. The Rozetta soil and Urban land occur as areas so intricately mixed or so small that mapping them separately is not practical.

Typically, the surface layer of the Rozetta soil is dark grayish brown, friable silt loam about 8 inches thick. The subsoil extends to a depth of about 60 inches. It is yellowish brown and friable. The upper part is silt loam, the next part is silty clay loam, and the lower part is mottled silty clay loam and silt loam. In some areas the seasonal high water table is at a depth of less than 4 feet or more than 6 feet. In other areas the underlying material has glacial till. In places cinders are mixed into the upper 12 inches of the soil. Some small areas have been cut, built up, or smoothed.

The Urban land is covered by streets, parking lots, buildings, and other structures. The soils are so obscured or modified that the soil series cannot be identified.

Included with the Rozetta soil in mapping are small areas of the somewhat poorly drained Ipava and poorly drained Sable soils. These soils are lower on the landscape than the Rozetta soil. They make up 5 to 20 percent of the unit.

Water and air move through the Rozetta soil at a moderate rate. Surface runoff is medium. The seasonal high water table is 4 to 6 feet below the surface during the wettest periods of the year. Available water capacity is high. Organic matter content is moderately low. The shrink-swell potential is moderate, and the potential for frost action is high.

The Rozetta soil is used for parks, building site development, and lawns and gardens. It is moderately suited to dwellings and septic tank absorption fields. It is well suited to lawns and landscaping, vegetable and flower gardens, ornamental trees and shrubs, and recreational uses. It is poorly suited to local roads and streets.

If the Rozetta soil is used as a site for dwellings, the shrink-swell potential is a limitation. The seasonal high water table also is a limitation on sites for dwellings with basements. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling. Installing tile drains around the footings helps to lower the water table.

If the Rozetta soil is used as a site for local roads and streets, low strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

This map unit is not assigned a land capability classification.

3028—Jules silt loam, frequently flooded. This nearly level, moderately well drained soil is on flood plains. It is frequently flooded for long periods from October through June. Individual areas range from 12 to 315 acres in size.

Typically, the surface soil is stratified grayish brown, brown, and dark grayish brown, mottled, friable, calcareous silt loam about 12 inches thick. The underlying material to a depth of about 60 inches is multicolored, mottled, friable, and calcareous. The upper part is silt loam that has strata of loam, fine sandy loam, loamy sand, and sand, and the lower part is silt loam. In some places the soil contains more sand. In other places depth to the seasonal high water table is less than 3.5 feet.

Included with soil in mapping are small areas of the well drained Jasper, somewhat poorly drained La Hogue, and very poorly drained Palms soils. Jasper and La Hogue soils are on the higher parts of the landscape. Palms soils formed in organic material. They are on the lower parts of the landscape. Included soils make up 5 to 10 percent of the unit.

Water and air move through the Jules soil at a

moderate rate. Surface runoff is slow. The seasonal high water table is 3.5 to 6.0 feet below the surface during the wettest periods of the year. Available water capacity is very high. Organic matter content is moderately low. The potential for frost action is high.

Most areas are cultivated. This soil is moderately suited to woodland and cultivated crops. It is poorly suited to local roads and streets. It is generally unsuited to dwellings and septic tank absorption fields because of the flooding.

In areas used for corn, soybeans, or small grain, the flooding is a hazard. It can delay planting or interfere with harvesting. Adequately constructed and maintained levees can help to protect the cropland from flooding. Tillage when the soil is wet causes surface compaction and cloddiness. Adding organic material helps to maintain or improve tilth and fertility.

If this soil is used as a site for local roads and streets, the flooding is a hazard and low strength and the potential for frost action are limitations. Raising the roadbed with several feet of fill material to a height above the maximum flood stage reduces the hazard of flooding. Strengthening or replacing the base material helps to prevent the damage caused by low strength and frost action.

In areas used as woodland, seedling mortality is a management concern. Planting mature nursery stock on prepared ridges reduces the seedling mortality rate. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

The land capability classification is IIw.

3073—Ross silt loam, frequently flooded. This nearly level, well drained soil is on flood plains. It is frequently flooded for brief periods from October through June. Individual areas range from 3 to 100 acres in size.

Typically, the surface layer is very dark gray, friable silt loam about 8 inches thick. The subsurface layer is very dark grayish brown, friable silt loam about 5 inches thick. The subsoil is loam about 30 inches thick. The upper part is very dark grayish brown and friable, and the lower part is dark brown and brown and is friable and very friable. The underlying material to a depth of about 60 inches is brown, mottled, very friable sandy loam. In some places the surface soil is thicker. In other places it contains more sand. In some areas the subsoil contains more sand. In other areas the soil contains more silt. In places depth to the seasonal high water table is less than 4 feet.

Included with this soil in mapping are small areas of the well drained Jasper and somewhat poorly drained Lawson and Tice soils. Jasper soils are not subject to flooding and are higher on the landscape than the Ross soil. Lawson soils are in landscape positions similar to those of the Ross soil. They contain more silt than the Ross soil. Tice soils are in the higher landscape positions and are rarely flooded. Included soils make up 15 to 20 percent of the unit.

Water and air move through the upper part of the Ross soil at a moderate rate and through the lower part at a moderate or moderately rapid rate. Surface runoff is slow. The seasonal high water table is 4 to 6 feet below the surface during the wettest periods of the year. Available water capacity is high. Organic matter content is moderate. The potential for frost action also is moderate.

Most areas are cultivated. This soil is moderately suited to cultivated crops, well suited to woodland, and poorly suited to local roads and streets. It is generally unsuited to dwellings and septic tank absorption fields because of the flooding.

In areas used for corn, soybeans, or small grain, the flooding is a hazard. It can delay planting or interfere with harvesting. Adequately constructed and maintained levees can help to protect the cropland from flooding. Tillage when the soil is wet causes surface compaction and cloddiness. Adding organic material helps to maintain or improve tilth and fertility.

If this soil is used as a site for local roads and streets, the flooding is a hazard. Raising the roadbed with several feet of fill material to a height above the maximum flood stage reduces this hazard.

The land capability classification is IIw.

3074—Radford silt loam, frequently flooded. This nearly level, somewhat poorly drained soil is on flood plains. It is frequently flooded for brief periods from March through June. Individual areas range from 3 to 350 acres in size.

Typically, the surface soil is very dark grayish brown, friable silt loam about 19 inches thick. The underlying material is very dark gray, friable silt loam about 7 inches thick. It has thin strata of pale brown material. The lower part of the profile to a depth of about 60 inches is a buried soil, which is black, very dark grayish brown, grayish brown, and dark grayish brown, mottled, friable silty clay loam. In some places the surface soil is thicker. In other places it contains more sand. In some areas the buried soil contains more sand. In other areas the seasonal high water table is below a depth of 3 feet.

Included with this soil in mapping are small areas of the well drained Landes and Ross soils. These soils do not have a buried soil and contain more sand than the Radford soil. They are on the higher parts of the

landscape. They make up 5 to 10 percent of the unit.

Water and air move through the Radford soil at a moderate rate. Surface runoff is slow. The seasonal high water table is 1 to 3 feet below the surface during the wettest periods of the year. Available water capacity is very high. Organic matter content is moderate. The shrink-swell potential also is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to woodland, moderately suited to cultivated crops, and poorly suited to local roads and streets. It is generally unsuited to dwellings and septic tank absorption fields because of the flooding.

In areas used for corn, soybeans, or small grain, the flooding is a hazard and the seasonal high water table is a limitation. The wetness or the flooding delays planting or interferes with harvesting in many years. Surface ditches, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available. The wetness of this soil has been sufficiently reduced by a drainage system for production of the crops commonly grown in the county. Measures that maintain or improve the drainage system are needed. Adequately constructed and maintained levees can help to protect the cropland from flooding. Tillage when the soil is wet causes surface compaction and cloddiness. Adding organic material helps to maintain or improve tilth and fertility.

If this soil is used as a site for local roads and streets, the flooding is a hazard and low strength and the potential for frost action are limitations. Raising the roadbed with several feet of fill material to a height above the maximum flood stage reduces the hazard of flooding. Strengthening or replacing the base material helps to prevent the damage caused by low strength and frost action.

The land capability classification is IIIw.

3077—Huntsville silt loam, frequently flooded. This nearly level, well drained soil is on flood plains. It is frequently flooded for brief periods from October through June. Individual areas range from 5 to 560 acres in size.

Typically, the surface soil is very dark gray and very dark grayish brown, friable silt loam about 43 inches thick. The subsurface layer to a depth of about 60 inches is dark brown, friable silt loam. In some places strata of loam and sandy loam are common in the subsurface layer and in the underlying material. In other places the surface soil is thicker. In some areas the subsurface layer is thinner. In other areas depth to the seasonal high water table is less than 6 feet.

Included with this soil in mapping are small areas of the well drained Landes soils. These soils contain more sand than the Huntsville soil. They are on the higher parts of the landscape. They make up 10 to 20 percent of the unit.

Water and air move through the Huntsville soil at a moderate rate. Surface runoff is slow. Available water capacity is very high. Organic matter content is moderate. The shrink-swell potential also is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to woodland and cultivated crops. It is poorly suited to local roads and streets. It is generally unsuited to dwellings and septic tank absorption fields because of the flooding.

In areas used for corn, soybeans, or small grain, the flooding is a hazard. It delays planting or interferes with harvesting in some years. Adequately constructed and maintained levees can help to protect the cropland from flooding. Tillage when the soil is wet causes surface compaction and cloddiness. Adding organic material helps to maintain or improve tilth and fertility.

If this soil is used as a site for local roads and streets, the flooding is a hazard and low strength and the potential for frost action are limitations. Raising the roadbed with several feet of fill material to a height above the maximum flood stage reduces the hazard of flooding. Strengthening or replacing the base material helps to prevent the damage caused by low strength and frost action.

The land capability classification is IIw.

3107—Sawmill silty clay loam, frequently flooded. This nearly level, poorly drained soil is on flood plains. It is frequently flooded for brief periods from March through June. Individual areas range from 5 to 330 acres in size.

Typically, the surface soil is black and very dark gray, firm silty clay loam about 27 inches thick. The subsoil is mottled, firm silty clay loam about 25 inches thick. The upper part is gray, and the lower part is olive gray. The underlying material to a depth of about 60 inches is olive gray, mottled, friable silty clay loam. In some places the subsurface layer is thinner. In other places the soil contains more sand. In some areas the lower part of the subsoil and the underlying material contain less clay. In other areas, depth to the seasonal high water table is more than 2 feet and the soil has a dark buried soil.

Included with this soil in mapping are small areas of the well drained Birkbeck, Catlin, and Saybrook soils. These soils are on side slopes on the higher parts of the landscape. They make up 2 to 5 percent of the unit.

Water and air move through the Sawmill soil at a moderate rate. Surface runoff is slow. The seasonal high water table is within a depth of 2 feet during the

wettest periods of the year. Available water capacity is very high. Organic matter content is high. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is moderately suited to cultivated crops and to woodland. It is poorly suited to local roads and streets. It is generally unsuited to dwellings and septic tank absorption fields because of the flooding.

In areas used for corn, soybeans, or small grain, the flooding and ponding are hazards and the seasonal high water table is a limitation. The wetness or the flooding delays planting or interferes with harvesting in many years. Surface ditches, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available. The wetness of this soil has been sufficiently reduced by a drainage system for production of the crops commonly grown in the county. Measures that maintain or improve the drainage system are needed. Adequately constructed and maintained levees can help to protect the cropland from flooding. Tillage when the soil is wet causes surface compaction and cloddiness. Adding organic material helps to maintain or improve tilth and fertility.

In areas used as woodland, an equipment limitation, seedling mortality, and windthrow are management concerns because of the seasonal high water table. Plant competition also is a management concern. The use of equipment is limited to periods when the soil is firm. Planting mature nursery stock on prepared ridges reduces the seedling mortality rate. A harvesting method that does not isolate the remaining trees or leave them widely spaced reduces the hazard of windthrow. Removing only high-value trees from a strip 50 feet wide along the west and south edges of the woodland also reduces this hazard. The competition from undesirable vegetation in openings where timber has been harvested can be reduced by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

If this soil is used as a site for local roads and streets, the flooding is a hazard and the seasonal high water table and low strength are limitations. Raising the roadbed with several feet of fill material to a height above the maximum flood stage and constructing open ditches, which remove excess water, reduce the wetness and the hazard of flooding. Strengthening or replacing the base material helps to prevent the damage caused by low strength.

The land capability classification is IIIw.

3304—Landes fine sandy loam, frequently flooded. This nearly level, well drained soil is on flood plains. It is frequently flooded for brief periods from October through June. Individual areas range from 3 to 260 acres in size.

Typically, the surface layer is very dark grayish brown, friable fine sandy loam about 5 inches thick. The subsurface layer is very dark gray and very dark grayish brown, friable fine sandy loam about 16 inches thick. The subsoil is brown fine sandy loam about 18 inches thick. The upper part is very friable, and the lower part is friable. The underlying material to a depth of about 60 inches is brown, loose and friable, stratified loamy fine sand and fine sandy loam. In places the subsurface layer is thicker. In some areas the subsoil contains gravel. In other areas it contains more clay.

Included with this soil in mapping are small areas of the well drained Huntsville and Ross soils. These soils are in landscape positions similar to those of the Landes soil. They contain less sand and more clay than the Landes soil. They make up 10 to 20 percent of the unit.

Water and air move through the upper part of the Landes soil at a moderately rapid rate and through the lower part at a rapid rate. Surface runoff is slow. Available water capacity is moderate. Organic matter content is moderately low. The potential for frost action is moderate.

Most areas are cultivated. This soil is well suited to woodland and poorly suited to cultivated crops and to local roads and streets. It is generally unsuited to dwellings and septic tank absorption fields because of the flooding.

In areas used for corn, soybeans, or small grain, the flooding is a hazard and the moderate available water capacity is a limitation. The flooding delays planting or interferes with harvesting in some years. Adequately constructed and maintained levees can help to protect the cropland from flooding. A conservation tillage system that leaves crop residue on the surface and field windbreaks conserve moisture. Irrigation can help to compensate for the moderate available water capacity. Adding organic material increases the available water capacity and improves fertility.

If this soil is used as a site for local roads and streets, the flooding is a hazard. Raising the roadbed with several feet of fill material to a height above the maximum flood stage reduces this hazard.

The land capability classification is IIIw.

3451—Lawson silt loam, frequently flooded. This nearly level, somewhat poorly drained soil is on flood plains. It is frequently flooded for brief periods from

October through June. Individual areas range from 5 to 200 acres in size.

Typically, the surface layer is very dark gray and black, friable silt loam about 32 inches thick. The subsurface layer is dark grayish brown, mottled, friable silty clay loam about 8 inches thick. The underlying material to a depth of about 60 inches is mottled, friable, calcareous loam, sandy loam, and silt loam. The upper part is dark grayish brown, and the lower part is light brownish gray. In places the seasonal high water table is less than 1 foot or more than 3 feet below the surface. In some areas the lighter colored material is closer to the surface. In other areas the soil is underlain by a buried soil.

Included with this soil in mapping are small areas of the well drained Miami, Hennepin, and Warsaw and moderately well drained Plano soils. Miami, Hennepin, and Warsaw soils are on side slopes adjacent to the Lawson soil. Plano soils are not subject to flooding and are higher on the landscape than the Lawson soil. Also, they have a thinner surface layer. Included soils make up 5 to 10 percent of the unit.

Water and air move through the Lawson soil at a moderate rate. Surface runoff is slow. The seasonal high water table is 1 to 3 feet below the surface during the wettest periods of the year. Available water capacity is very high. Organic matter content is moderate. The shrink-swell potential also is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is moderately suited to woodland and cultivated crops. It is poorly suited to local roads and streets. It is generally unsuited to dwellings and septic tank absorption fields because of the flooding.

In areas used for corn, soybeans, or small grain, the flooding is a hazard and the seasonal high water table is a limitation. The wetness or the flooding delays planting or interferes with harvesting in many years. Surface ditches, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available. The wetness of this soil has been sufficiently reduced by a drainage system for production of the crops commonly grown in the county. Measures that maintain or improve the drainage system are needed. Adequately constructed and maintained levees can help to protect the cropland from flooding. Tillage when the soil is wet causes surface compaction and cloddiness. Adding organic material helps to maintain or improve tilth and fertility.

If this soil is used as a site for local roads and streets, the flooding is a hazard and the potential for frost action is a limitation. Raising the roadbed with several feet of fill material to a height above the maximum flood stage reduces the hazard of flooding. Strengthening or replacing the base material reduces the potential for frost action.

The land capability classification is IIIw.

7070—Beaucoup silty clay loam, rarely flooded. This nearly level, poorly drained soil is on flood plains. It is subject to rare flooding of brief duration from March through June. Individual areas range from 5 to 120 acres in size.

Typically, the surface layer is very dark grayish brown, firm silty clay loam about 6 inches thick. The subsurface layer is very dark gray, mottled, firm silty clay loam about 5 inches thick. The subsoil to a depth of about 60 inches is mottled, firm silty clay loam. The upper part is dark gray, the next part is grayish brown, and the lower part is dark gray. In places the surface soil is thinner. In some areas the subsoil contains more sand. In other areas it contains more clay.

Included with this soil in mapping are small areas of the poorly drained Titus soils. These soils are in shallow depressions below the Beaucoup soil. They make up 2 to 10 percent of the unit.

Water and air move through the Beaucoup soil at a moderately slow rate. Surface runoff is slow to ponded. The seasonal high water table is 0.5 foot above to 2.0 feet below the surface during the wettest periods of the year. Available water capacity is high. Organic matter content also is high. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops. It is poorly suited to woodland and to local roads and streets. It is generally unsuited to dwellings and septic tank absorption fields because of the flooding.

In areas used for corn, soybeans, or small grain, the flooding and ponding are hazards and the seasonal high water table is a limitation. The wetness or the flooding delays planting or interferes with harvesting in many years. Surface ditches, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available. The wetness of this soil has been sufficiently reduced by a drainage system for production of the crops commonly grown in the county. Measures that maintain or improve the drainage system are needed. Adequately constructed and maintained levees can help to protect the cropland from flooding. Tillage when the soil is wet causes surface compaction and cloddiness. Adding organic material helps to maintain or improve tilth and fertility.

In areas used as woodland, an equipment limitation, seedling mortality, and windthrow are management concerns because of the seasonal high water table. The use of equipment is limited to periods when the soil is firm. Planting mature nursery stock on prepared ridges

reduces the seedling mortality rate. A harvesting method that does not isolate the remaining trees or leave them widely spaced reduces the hazard of windthrow. Removing only high-value trees from a strip 50 feet wide along the west and south edges of the woodland also reduces this hazard. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

If this soil is used as a site for local roads and streets, ponding is a hazard and the seasonal high water table and low strength are limitations. Constructing open ditches, which remove excess water, and raising the roadbed with suitable fill material reduce the wetness and the hazard of ponding. Strengthening or replacing the base material helps to prevent the damage caused by low strength.

The land capability classification is IIw.

7302—Ambraw loam, rarely flooded. This nearly level, poorly drained soil is on flood plains. It is subject to rare flooding of brief duration from March through June. Individual areas range from 3 to 2,860 acres in size.

Typically, the surface layer is very dark gray, friable loam about 10 inches thick. The subsurface layer is very dark gray, friable silty clay loam about 6 inches thick. The subsoil is about 36 inches thick. The upper part is dark grayish brown, firm and friable clay loam; the next part is dark grayish brown, friable loam; and the lower part is grayish brown, friable loam. The underlying material to a depth of about 60 inches is gray, very friable and loose, stratified sandy loam to sand. In some places the surface layer is calcareous. In other places the surface soil is thicker. In some areas the soil contains less sand and more clay. In other areas the underlying material is within a depth of 40 inches and contains gravel.

Included with this soil in mapping are small areas of the well drained Landes and somewhat poorly drained Tice soils. Landes soils are on the slightly higher parts of the landscape. Tice soils are on the slightly lower parts of the landscape. Included soils make up 10 to 20 percent of the unit.

Water and air move through the Ambraw soil at a moderately slow rate. Surface runoff is slow to ponded. The seasonal high water table is 0.5 foot above to 2.0 feet below the surface during the wettest periods of the year. Available water capacity is high. Organic matter content is moderate. The shrink-swell potential also is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops. It is poorly suited to woodland and to local roads and streets. It is generally unsuited to dwellings and septic tank absorption fields because of the flooding.

In areas used for corn, soybeans, or small grain, the flooding and ponding are hazards and the seasonal high water table is a limitation. The wetness or the flooding delays planting or interferes with harvesting in many years. Surface ditches, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available. The wetness of this soil has been sufficiently reduced by a drainage system for production of the crops commonly grown in the county. Measures that maintain or improve the drainage system are needed. Adequately constructed and maintained levees can help to protect the cropland from flooding. Tillage when the soil is wet causes surface compaction and cloddiness. Adding organic material helps to maintain or improve tilth and fertility.

If this soil is used as a site for local roads and streets, the flooding is a hazard and the seasonal high water table and low strength are limitations. Constructing open ditches, which remove excess water, and raising the roadbed with suitable fill material reduce the wetness and the hazard of flooding. Strengthening or replacing the base material helps to prevent the damage caused by low strength.

The land capability classification is IIw.

7404—Titus silty clay, rarely flooded. This nearly level, poorly drained soil is on flood plains. It is subject to rare flooding of brief duration from March through June. Individual areas range from 3 to 1,220 acres in size.

Typically, the surface soil is very dark gray, firm silty clay about 11 inches thick. The subsoil extends to a depth of about 60 inches. It is mottled and firm. The upper part is dark gray silty clay, the next part is gray silty clay and silty clay loam, and the lower part is gray silty clay loam. In some areas the subsoil has less clay. In other areas it has more clay. In places the surface layer is thicker.

Included with this soil in mapping are small areas of the poorly drained Ambraw and moderately well drained Onarga soils. Ambraw soils contain more sand than the Titus soil. They are on the slightly higher parts of the landscape or are in landscape positions similar to those of the Titus soil. Onarga soils contain more sand than the Titus soil. They are in the higher landscape positions. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Titus soil at a slow rate. Surface runoff is slow to ponded. The seasonal high water table is 0.5 foot above to 2.0 feet below the surface during the wettest periods of the year. Available

water capacity is moderate. Organic matter content also is moderate. The shrink-swell potential and the potential for frost action are high.

Most areas are cultivated. This soil is well suited to cultivated crops. It is poorly suited to woodland and to local roads and streets. It is generally unsuited to dwellings and septic tank absorption fields because of the flooding.

In areas used for corn, soybeans, or small grain, the flooding and ponding are hazards and the seasonal high water table is a limitation. The wetness or the flooding delays planting or interferes with harvesting in many years. Surface ditches, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available. The wetness of this soil has been sufficiently reduced by a drainage system for production of the crops commonly grown in the county. Measures that maintain or improve the drainage system are needed. Adequately constructed and maintained levees can help to protect the cropland from flooding. Tillage when the soil is wet causes surface compaction and cloddiness. Adding organic material helps to maintain or improve tilth and fertility.

In areas used as woodland, an equipment limitation, seedling mortality, and windthrow are management concerns because of the seasonal high water table. The use of equipment is limited to periods when the soil is firm. Planting mature nursery stock on prepared ridges reduces the seedling mortality rate. A harvesting method that does not isolate the remaining trees or leave them widely spaced reduces the hazard of windthrow. Removing only high-value trees from a strip 50 feet wide along the west and south edges of the woodland also reduces this hazard. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

If this soil is used as a site for local roads and streets, ponding is a hazard and low strength and the shrink-swell potential are limitations. Constructing open ditches, which remove excess water, and raising the roadbed with suitable fill material reduce the wetness and the hazard of ponding. Strengthening or replacing the base material helps to prevent the damage caused by low strength and by shrinking and swelling.

The land capability classification is IIIw.

8028—Jules silt loam, occasionally flooded. This nearly level, moderately well drained soil is on flood plains. It is occasionally flooded for long periods from October through June. Individual areas range from 6 to 220 acres in size.

Typically, the surface layer is brown, friable silt loam about 10 inches thick. The underlying material to a depth of about 60 inches is multicolored, friable, calcareous silt and silt loam having strata of loam, sandy loam, and loamy sand. In some places the soil contains more sand. In other places depth to the seasonal high water table is less than 3.5 feet.

Included with soil in mapping are small areas of the well drained Jasper, somewhat poorly drained La Hogue, and very poorly drained Palms soils. Jasper and La Hogue soils are on the higher parts of the landscape. Palms soils formed in organic material. They are on the lower parts of the landscape. Included soils make up 10 to 15 percent of the unit.

Water and air move through the Jules soil at a moderate rate. Surface runoff is slow. The seasonal high water table is 3.5 to 6.0 feet below the surface during the wettest periods of the year. Available water capacity is high. Organic matter content is moderately low. The potential for frost action is high.

Most areas are cultivated. This soil is moderately suited to cultivated crops and to woodland. It is poorly suited to local roads and streets. It is generally unsuited to dwellings and septic tank absorption fields because of the flooding.

In areas used for corn, soybeans, or small grain, the flooding is a hazard. It delays planting or interferes with harvesting in some years. Adequately constructed and maintained levees can help to protect the cropland from flooding. Tillage when the soil is wet causes surface compaction and cloddiness. Adding organic material helps to maintain or improve tilth and fertility.

In areas used as woodland, seedling mortality is a management concern. Planting mature nursery stock on prepared ridges reduces the seedling mortality rate. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

If this soil is used as a site for local roads and streets, the flooding is a hazard and the potential for frost action is a limitation. Raising the roadbed with several feet of fill material to a height above the maximum flood stage reduces the hazard of flooding. Strengthening or replacing the base material reduces the potential for frost action.

The land capability classification is IIw.

8284—Tice silt loam, occasionally flooded. This nearly level, somewhat poorly drained soil is on flood plains. It is occasionally flooded for brief periods from October through June. Individual areas range from 2 to 245 acres in size.

Typically, the surface layer is very dark grayish

brown, friable silt loam about 7 inches thick. The subsurface layer is very dark grayish brown, mottled, friable silt loam about 14 inches thick. The subsoil is about 29 inches thick. It is brown, mottled, and friable. The upper part is silt loam, the next part is silty clay loam, and the lower part is silt loam. The underlying material to a depth of about 60 inches is pale brown, mottled, friable, calcareous silt loam. In some places the lower part of the subsoil contains more sand. In other places depth to the seasonal high water table is more than 30 inches. In some areas the surface layer contains more clay. In other areas it is lighter colored.

Included with this soil in mapping are small areas of the poorly drained Beaucoup and well drained Huntsville and Ross soils. These soils are frequently flooded. They are on the lower parts of the landscape. Ross soils contain more sand than the Tice soil. Included soils make up 10 to 20 percent of the unit.

Water and air move through the Tice soil at a moderate rate. Surface runoff is slow. The seasonal high water table is 1.5 to 3.0 feet below the surface during the wettest periods of the year. Available water capacity is very high. Organic matter content is moderately low. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops and to woodland and is poorly suited to local roads and streets. It is generally unsuited to dwellings and septic tank absorption fields because of the flooding.

In areas used for corn, soybeans, or small grain, the flooding is a hazard and the seasonal high water table is a limitation. The wetness or the flooding delays planting or interferes with harvesting in many years. Surface ditches, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available. The wetness of this soil has been sufficiently reduced by a drainage system for production of the crops commonly grown in the county. Measures that maintain or improve the drainage system are needed. Adequately constructed and maintained levees can help to protect the cropland from flooding. Tillage when the soil is wet causes surface compaction and cloddiness. Adding organic material helps to maintain or improve tilth and fertility.

If this soil is used as a site for local roads and streets, the flooding is a hazard and low strength and the potential for frost action are limitations. Raising the roadbed with several feet of fill material to a height above the maximum flood stage reduces the hazard of flooding. Strengthening or replacing the base material helps to prevent the damage caused by low strength and frost action.

The land capability classification is IIw.

Prime Farmland

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation's short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is the land that is best suited to food, feed, forage, fiber, and oilseed crops. It may be cultivated land, pasture, woodland, or other land, but it is not urban or built-up land or water areas. It either is used for food or fiber crops or is available for those crops. The soil qualities, growing season, and moisture supply are those needed for a well managed soil to produce a sustained high yield of crops in an economic manner. Prime farmland produces the highest yields with minimal expenditure of energy and economic resources, and farming it results in the least damage to the environment.

Prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable. The level of acidity or alkalinity is acceptable. Prime farmland has few or no rocks and is permeable to water and air. It is not excessively erodible or saturated with water for long periods and is not frequently flooded during the growing season. The slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

About 310,000 acres in the survey area, or nearly 75 percent of the total acreage, meets the soil requirements for prime farmland. Associations 1 and 2, which are described under the heading "General Soil Map Units," have the highest percentage of prime farmland. About 305,400 acres of this land is used for crops, mainly corn and soybeans.

The map units in the survey area that are considered prime farmland are listed in table 5. This list does not constitute a recommendation for a particular land use. The extent of each listed map unit is shown in table 4. The location is shown on the detailed soil maps at the back of this publication. The soil qualities that affect use and management are described under the heading "Detailed Soil Map Units."

Some soils that have a seasonal high water table and all soils that are frequently flooded during the growing season qualify as prime farmland only in areas where these limitations have been overcome by

drainage measures or flood control. The need for these measures is indicated after the map unit name in table 5. Onsite evaluation is needed to determine whether or not these limitations have been overcome by corrective measures. Most of the naturally wet soils in Tazewell County have been drained.

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help to prevent soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Crops and Pasture

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils, including some not commonly grown in the survey area, are identified; the system of land capability classification used by the Natural Resources Conservation Service is explained; and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under the heading "Detailed Soil Map Units." Specific information can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

About 305,400 acres in Tazewell County is used as cropland, and 20,200 acres is used as permanent pasture. The soils in the county have good potential for the production of crops, particularly corn, soybeans, and hay.

The main management needs on the cropland and pasture in the county are measures that control erosion and soil blowing, lower the seasonal high water table, and improve fertility and tilth. Water erosion is a hazard on more than 42 percent of the acreage in the county. It is a hazard if the slope is more than 2 percent and the surface is not protected.

Erosion is damaging for three main reasons. First, productivity is reduced as the surface layer, which contains more organic matter and plant nutrients than other parts of the profile, is lost and the less productive subsoil is incorporated into the plow layer. Second, severe erosion reduces the rate of water infiltration and increases the runoff rate. Third, erosion allows sediment to enter waterways, ponds, streams, lakes, ditches, and rivers. Removing this sediment is expensive. Management that controls erosion minimizes the pollution caused by sediment and improves water quality for municipal and recreational uses and for fish and wildlife.

Several conservation practices can reduce the hazard of erosion and the runoff rate and increase the rate of water infiltration. Examples are terraces, contour farming, and no-till farming and other kinds of conservation tillage that leave crop residue on the surface after planting. Terraces, contour farming, and

conservation tillage help to control erosion by decreasing the rate of runoff or dissipating the force of raindrops. Terraces are effective on slopes that are uniform and are not broken by many drainageways. Contour farming, which includes both tilling and planting on the contour, is most effective in areas where the slope is 7 percent or less. It is commonly used in combination with terraces. Land smoothing helps to align the terraces and facilitates contour farming. A conservation tillage system is one in which crop residue is left on the surface at least through the planting season. The crop residue protects the soil from erosion, helps to maintain good soil structure, minimizes surface compaction, and improves tilth.

Sandy soils are susceptible to soil blowing. The hazard of soil blowing can be reduced by a cover of plants or mulch and by windbreaks.

Further information about measures that control erosion and soil blowing is available at the local office of the Natural Resources Conservation Service.

In most of the poorly drained soils in the county, some type of drainage system has been installed. The seasonal high water table has been effectively lowered in most areas where it is a limitation. Measures that maintain the drainage system are needed.

Maintaining fertility and tilth is important in areas used for crops or pasture. Additions of lime, nitrogen, phosphorus, potassium, and manure are needed to maintain the fertility of most soils. Applications of fertilizer should be based on the results of soil tests.

Soil tilth affects the germination of seeds, the rate of runoff, and the rate of water infiltration. Poor tilth is a problem in soils that have a light colored surface layer that is in low content of organic matter. Including grasses or legumes in the crop rotation, adding manure, and chisel plowing improve tilth.

Yields per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 6. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The land capability classification also is shown in the table.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents *(3)*. Available yield data from nearby counties and results of field trials and demonstrations are also considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 6 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Natural Resources Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management *(5)*. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for woodland or for engineering purposes.

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit. Only class and subclass are used in this survey.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have few limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class IV soils have very severe limitations that

reduce the choice of plants or that require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, IIe. The letter *e* shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c,* used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class I there are no subclasses because the soils of this class have few limitations. Class V contains only the subclasses indicated by *w, s,* or *c* because the soils in class V are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, woodland, wildlife habitat, or recreation.

The capability classification of the map units in this survey area is given in the section "Detailed Soil Map Units" and in the yields table.

Woodland Management and Productivity

Most of the trees have been cleared from the soils in Tazewell County that are suitable for cultivated crops. As a result, much of the remaining woodland is in areas of soils that are unsuitable for cultivation. These areas are too steep, too wet, or too sandy for cultivated crops. The wooded areas make up approximately 16,000 acres in the county. The largest area of woodland is in association 5, which is described under the heading "General Soil Map Units."

The most common trees in the uplands are white oak, red oak, hickory, ash, maple, boxelder, and walnut. The most common trees on flood plains are cottonwood, sycamore, willow, white oak, and hickory.

Much of the existing woodland can be improved by thinning overpopulated stands and removing mature trees and trees of low value. Measures that protect the woodland from fire and grazing are needed. Logging trails and access roads commonly are on steep slopes. Shaping and seeding these trails and roads and applying fertilizer immediately after the trees are harvested help to control erosion. Interplanting is needed for maximum production. Control or removal of competing vegetation is needed if seedlings are planted. A cover of grasses is needed if seedlings are planted in bare, sloping areas.

Table 7 can be used by woodland owners or forest managers in planning the use of soils for wood crops. Only those soils suitable for wood crops are listed. The table lists the ordination symbol for each soil. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity.

The first part of the *ordination symbol,* a number, indicates the potential productivity of the soils for an indicator tree species. The number indicates the volume, in cubic meters per hectare per year, which the indicator species can produce. The number 1 indicates low potential productivity; 2 and 3, moderate; 4 and 5, moderately high; 6 to 8, high; 9 to 11, very high; and 12 to 39, extremely high. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *R* indicates steep slopes; *X,* stoniness or rockiness; *W,* excess water in or on the soil; *T,* toxic substances in the soil; *D,* restricted rooting depth; *C,* clay in the upper part of the soil; *S,* sandy texture; and *F,* a high content of rock fragments in the soil. The letter *A* indicates that limitations or restrictions are insignificant. If a soil has more than one limitation, the priority is as follows: R, X, W, T, D, C, S, and F.

In table 7, *slight, moderate,* and *severe* indicate the degree of the major soil limitations to be considered in management.

Erosion hazard is the probability that damage will occur as a result of site preparation and cutting where the soil is exposed along roads, skid trails, and fire lanes and in log-handling areas. Forests that have been burned or overgrazed are also subject to erosion. Ratings of the erosion hazard are based on the percent of the slope. A rating of *slight* indicates that no particular prevention measures are needed under ordinary conditions. A rating of *moderate* indicates that erosion-control measures are needed in certain silvicultural activities. A rating of *severe* indicates that special precautions are needed to control erosion in most silvicultural activities.

Equipment limitation reflects the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. The chief characteristics and conditions considered in the ratings are slope, stones on the surface, rock outcrops, soil wetness, and texture of the surface layer. A rating of *slight* indicates that under normal conditions the kind of equipment and season of

use are not significantly restricted by soil factors. Soil wetness can restrict equipment use, but the wet period does not exceed 1 month. A rating of *moderate* indicates that equipment use is moderately restricted because of one or more soil factors. If the soil is wet, the wetness restricts equipment use for a period of 1 to 3 months. A rating of *severe* indicates that equipment use is severely restricted either as to the kind of equipment that can be used or the season of use. If the soil is wet, the wetness restricts equipment use for more than 3 months.

Seedling mortality refers to the death of naturally occurring or planted tree seedlings, as influenced by the kinds of soil, soil wetness, or topographic conditions. The factors used in rating the soils for seedling mortality are texture of the surface layer, depth to a seasonal high water table and the length of the period when the water table is high, rock fragments in the surface layer, effective rooting depth, and slope aspect. A rating of *slight* indicates that seedling mortality is not likely to be a problem under normal conditions. Expected mortality is less than 25 percent. A rating of *moderate* indicates that some problems from seedling mortality can be expected. Extra precautions are advisable. Expected mortality is 25 to 50 percent. A rating of *severe* indicates that seedling mortality is a serious problem. Extra precautions are important. Replanting may be necessary. Expected mortality is more than 50 percent.

Windthrow hazard is the likelihood that trees will be uprooted by the wind because the soil is not deep enough for adequate root anchorage. The main restrictions that affect rooting are a seasonal high water table and the depth to bedrock, a fragipan, or other limiting layers. A rating of *slight* indicates that under normal conditions no trees are blown down by the wind. Strong winds may damage trees, but they do not uproot them. A rating of *moderate* indicates that some trees can be blown down during periods when the soil is wet and winds are moderate or strong. A rating of *severe* indicates that many trees can be blown down during these periods.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a *site index* and as a *productivity class*. The site index is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

The *productivity class*, a number, is the yield likely to be produced by the most important trees. This number, expressed as cubic meters per hectare per year, indicates the amount of fiber produced in a fully stocked, even-aged, unmanaged stand.

The first species listed under *common trees* for a soil is the indicator species for that soil. It generally is the most common species on the soil and is the one that determines the ordination class.

Trees to plant are those that are suitable for commercial wood production.

Windbreaks and Environmental Plantings

Windbreaks protect livestock, buildings, and yards from wind and snow. They also protect fruit trees and gardens, and they furnish habitat for wildlife. Several rows of low- and high-growing broadleaf and coniferous trees and shrubs provide the most protection.

Field windbreaks are narrow plantings made at right angles to the prevailing wind and at specific intervals across the field. The interval depends on the erodibility of the soil. Field windbreaks protect cropland and crops from wind, help to keep snow on the fields, and provide food and cover for wildlife.

Environmental plantings help to beautify and screen houses and other buildings and to abate noise. The plants, mostly evergreen shrubs and trees, are closely spaced. To ensure plant survival, a healthy planting stock of suitable species should be planted properly on a well prepared site and maintained in good condition.

Table 8 shows the height that locally grown trees and shrubs are expected to reach in 20 years on various soils. The estimates in table 8 are based on measurements and observation of established plantings that have been given adequate care. They can be used as a guide in planning windbreaks and screens. Additional information on planning windbreaks and screens and planting and caring for trees and shrubs can be obtained from local offices of the Natural Resources Conservation Service or the Cooperative Extension Service or from a commercial nursery.

Recreation

The main recreational areas in Tazewell County are Spring Lake Conservation Area and State Park, Powerton Fish and Wildlife Area, Pekin Lake Conservation Area, Farmdale Recreation Area, and Parklands Recreational Area. These areas and the Illinois River provide opportunities for hunting, fishing, camping, hiking, canoeing, and boating.

The soils of the survey area are rated in table 9 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in

evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 9, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or a combination of these measures.

The information in table 9 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 12 and interpretations for dwellings without basements and for local roads and streets in table 11.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

Paths and trails for hiking and horseback riding should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones or boulders on the surface.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

Tazewell County provides habitat for a large and varied population of game and nongame fish and wildlife. Association 5, which is described under the heading "General Soil Map Units," has large areas of habitat for woodland wildlife, such as whitetail deer, squirrels, raccoons, rabbits, and songbirds. Areas of cropland provide food and cover for many types of openland wildlife, such as rabbits, woodchucks, doves, quail, and pheasants.

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 10, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or

maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flooding. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, soybeans, wheat, oats, and rye.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flooding, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flooding. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, wheatgrass, and grama.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, poplar, cherry, sweetgum, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are Russian-olive, autumn-olive, and crabapple.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, spruce, fir, cedar, and juniper.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, cattail, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. Wildlife attracted to these areas include bobwhite quail, pheasant, meadowlark, field sparrow, cottontail, and red fox.

Habitat for woodland wildlife consists of areas of deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, skunk, woodcock, thrushes, woodpeckers, squirrels, opossum, raccoon, and deer.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, gulls, muskrat, mink, and beaver.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, sanitary facilities, construction materials, and water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or

for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 or 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building Site Development

Table 11 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, a cemented pan, or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and depth to the water table.

Dwellings and *small commercial buildings* are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrinking and swelling, and organic layers can cause the movement of footings. A high water table, depth to bedrock or to a cemented pan, large stones, slope, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 or 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or stabilized soil material; and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock or to a cemented pan, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, frost action potential, and depth to a high water table affect the traffic-supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of

the soils. Soil reaction, a high water table, depth to bedrock or to a cemented pan, the available water capacity in the upper 40 inches, and the content of salts, sodium, and sulfidic materials affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

Sanitary Facilities

Table 12 shows the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 12 also shows the suitability of the soils for use as daily cover for landfill. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, depth to bedrock or to a cemented pan, and flooding affect absorption of the effluent. Large stones and bedrock or a cemented pan interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

Table 12 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock or to a cemented pan, flooding, large stones, and content of organic matter.

Excessive seepage resulting from rapid permeability in the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground-water pollution. Ease of excavation and revegetation should be considered.

The ratings in table 12 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a cemented pan, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to soil blowing.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as the final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 13 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a *probable* or *improbable* source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help to determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, a low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have a moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet and have a water table at a depth of less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and *gravel* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In table 13, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, rock fragments, bedrock, and toxic material.

Soils rated *good* have friable, loamy material to a

depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel, stones, or soluble salts, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel, stones, or soluble salts, have slopes of more than 15 percent, or have a seasonal high water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water Management

Table 14 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas and for embankments, dikes, and levees. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, irrigation, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and the potential for frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, and sulfur. Availability of drainage outlets is not considered in the ratings.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock or to a cemented pan. The performance of a system is affected by the depth of the root zone, the amount of salts or sodium, and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to control erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or to a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of soil blowing or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct

surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock or to a cemented pan affect the construction of grassed waterways. A hazard of soil blowing, low available water capacity, restricted rooting depth, toxic substances such as salts or sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classification, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

Engineering Index Properties

Table 15 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under the heading "Soil Series and Their Morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as about 15 percent, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system *(2)* and the system adopted by the American Association of State Highway and Transportation Officials *(1)*.

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Rock fragments larger than 3 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

Physical and Chemical Properties

Table 16 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at ⅓-bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, greater than 9 percent, is sometimes used.

Erosion factor K indicates the susceptibility of a soil

to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.05 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their resistance to soil blowing in cultivated areas. The groups indicate the susceptibility to soil blowing. Soils are grouped according to the following distinctions:

1. Coarse sands, sands, fine sands, and very fine sands. These soils are generally not suitable for crops. They are extremely erodible, and vegetation is difficult to establish.

2. Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, and sapric soil material. These soils are very highly erodible. Crops can be grown if intensive measures to control soil blowing are used.

3. Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams. These soils are highly erodible. Crops can be grown if intensive measures to control soil blowing are used.

4L. Calcareous loams, silt loams, clay loams, and silty clay loams. These soils are erodible. Crops can be grown if intensive measures to control soil blowing are used.

4. Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay. These soils are moderately erodible. Crops can be grown if measures to control soil blowing are used.

5. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material. These soils are slightly erodible. Crops can be grown if measures to control soil blowing are used.

6. Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay. These soils are very slightly erodible. Crops can be grown if ordinary measures to control soil blowing are used.

7. Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material. These soils are very slightly erodible. Crops can be grown if ordinary measures to control soil blowing are used.

8. Soils that are not subject to soil blowing because of rock fragments on the surface or because of surface wetness.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 16, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Soil and Water Features

Table 17 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. They are grouped according to the infiltration of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to two hydrologic groups in table 17, the first letter is for drained areas and the second is for undrained areas.

Flooding, the temporary inundation of an area, is caused by overflowing streams, by runoff from adjacent

slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, nor is water in swamps and marshes.

Table 17 gives the frequency and duration of flooding and the time of year when flooding is most likely.

Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); and *frequent* that it occurs often under normal weather conditions (the chance of flooding is more than 50 percent in any year). Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 days to 1 month, and *very long* if more than 1 month. Probable dates are expressed in months. About two-thirds to three-fourths of all flooding occurs during the stated period.

The information about flooding is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 17 are depth to the seasonal high water table; the kind of water table—that is, perched or apparent; and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in table 17.

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Only saturated zones within a depth of about 6 feet are indicated. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. The first numeral in the range indicates how high the water rises above the surface. The second numeral indicates the depth below the surface.

Potential frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage mainly to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low, moderate,* or *high,* is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low, moderate,* or *high.* It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories *(6)*. Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 18 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Eleven soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Mollisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Aquoll (*Aqu*, meaning water, plus *oll*, from Mollisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Haplaquolls (*Hapl*, meaning minimal horizonation, plus *aquoll*, the suborder of the Mollisols that has an aquic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Haplaquolls.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, mixed, mesic Typic Haplaquolls.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the underlying material can differ within a series.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the "Soil Survey Manual" *(7)*. Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" *(6)*. Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed Soil Map Units."

Alvin Series

The Alvin series consists of well drained, moderately rapidly permeable soils on terraces. These soils formed in wind- or water-deposited loamy and sandy material. Slopes range from 0 to 12 percent.

Typical pedon of Alvin loamy sand, 0 to 3 percent slopes, 189 feet south and 1,060 feet east of the northwest corner of sec. 15, T. 23 N., R. 7 W.

Ap—0 to 8 inches; brown (10YR 4/3) loamy sand, pale brown (10YR 6/3) dry; weak fine granular structure; very friable; few very fine roots; few pebbles; neutral; abrupt smooth boundary.

Bt1—8 to 13 inches; brown (7.5YR 4/4) sandy loam; weak fine subangular blocky structure; very friable; few very fine roots; common distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; neutral; clear smooth boundary.

Bt2—13 to 21 inches; brown (7.5YR 4/4) sandy loam; moderate fine subangular blocky structure; friable; few very fine roots; common distinct dark brown (7.5YR 3/4) clay films on faces of peds; neutral; clear smooth boundary.

Bt3—21 to 26 inches; brown (7.5YR 4/4) sandy loam; weak fine subangular blocky structure; very friable; few very fine roots; few distinct dark brown (7.5YR 3/4) clay films on faces of peds; slightly acid; clear smooth boundary.

E&Bt—26 to 60 inches; strong brown (7.5YR 5/6) sand (E); single grain; loose; strong brown (7.5YR 4/6) lamellae of loamy sand (Bt); weak fine subangular blocky structure; very friable; medium acid.

The thickness of the solum ranges from 36 to more than 60 inches. The Ap horizon has value and chroma of 3 or 4. It is loamy sand or fine sandy loam. The Bt horizon has hue of 7.5YR or 10YR and chroma of 3 to 6. It is sandy loam or loam. It generally is medium acid or strongly acid. In some pedons in areas that have been limed, however, it is slightly acid or neutral. The E&Bt horizon has hue of 7.5YR or 10YR and chroma of 4 to 6. It is sandy loam, loamy sand, or sand. In some pedons it does not have lamellae in the lower part.

Ambraw Series

The Ambraw series consists of poorly drained, moderately slowly permeable soils on flood plains. These soils formed in loamy alluvium. Slopes range from 0 to 2 percent.

Typical pedon of Ambraw loam, rarely flooded, 177 feet south and 1,824 feet west of the northeast corner of sec. 2, T. 23 N., R. 6 W.

Ap—0 to 10 inches; very dark gray (10YR 3/1) loam, dark gray (10YR 4/1) dry; weak fine granular structure; friable; common very fine roots; medium acid; clear smooth boundary.

A—10 to 16 inches; very dark grayish brown (10YR 3/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine and medium granular structure; friable; common very fine roots; neutral; clear smooth boundary.

Bg1—16 to 25 inches; dark grayish brown (2.5Y 4/2) clay loam; few fine prominent yellowish brown (10YR 5/6) mottles; weak fine prismatic structure parting to moderate fine subangular blocky; firm; common very fine roots; many distinct very dark gray (N 3/0) organic coatings on faces of peds; neutral; clear smooth boundary.

Bg2—25 to 39 inches; dark grayish brown (2.5Y 4/2) clay loam; common fine prominent yellowish brown (10YR 5/6) mottles; weak fine prismatic structure parting to weak fine and medium subangular blocky; friable; few very fine and fine roots; many distinct very dark gray (N 3/0) organic coatings on faces of peds; neutral; clear smooth boundary.

Bg3—39 to 45 inches; dark grayish brown (2.5Y 4/2) loam; many fine prominent strong brown (7.5YR 5/6) mottles; weak medium prismatic structure parting to weak fine and medium subangular blocky; friable; few very fine roots; many fine accumulations of iron and manganese oxide; very dark gray (10YR 3/1) fillings in root channels; neutral; clear smooth boundary.

BCg—45 to 52 inches; grayish brown (2.5Y 5/2) loam; many medium and coarse prominent strong brown (7.5YR 5/6) mottles; weak fine and medium subangular blocky structure; friable; few very fine roots; many fine accumulations of iron and manganese oxide; very dark gray (10YR 3/1) fillings in root channels; neutral; clear smooth boundary.

Cg—52 to 60 inches; gray (5Y 5/1), stratified sandy loam to loam; few fine prominent yellowish brown (10YR 5/6) mottles; massive; very friable and loose; mildly alkaline.

The thickness of the solum ranges from 40 to 55 inches. The thickness of the mollic epipedon ranges from 10 to 22 inches.

The A horizon has value of 2 or 3. The Bg horizon has hue of 10YR or 2.5Y and chroma of 1 or 2. The Cg horizon has hue of 10YR, 2.5Y, or 5Y, value of 4 or 5, and chroma of 1 or 2.

Atterberry Series

The Atterberry series consists of somewhat poorly drained, moderately permeable soils on uplands. These soils formed in loess. Slopes range from 0 to 2 percent.

Typical pedon of Atterberry silt loam, 330 feet north and 1,505 feet east of the center of sec. 29, T. 22 N., R. 2 W.

Ap—0 to 8 inches; very dark gray (10YR 3/1) silt loam, grayish brown (10YR 5/2) dry; weak medium

granular structure; friable; few very fine roots; neutral; abrupt smooth boundary.

E—8 to 11 inches; grayish brown (10YR 5/2) silt loam, light gray (10YR 7/2) dry; common fine faint brown (10YR 5/3) mottles; weak fine subangular blocky structure; friable; few very fine roots; common distinct very dark gray (10YR 3/1) organic coatings on faces of peds; neutral; clear smooth boundary.

Bt1—11 to 15 inches; brown (10YR 5/3) silty clay loam; few fine distinct yellowish brown (10YR 5/6) and few fine faint grayish brown (10YR 5/2) mottles; moderate fine subangular blocky structure; firm; few very fine roots; common distinct dark grayish brown (10YR 4/2) clay films and distinct very dark gray (10YR 3/1) organic coatings on faces of peds; few fine concretions of iron and manganese oxide; medium acid; clear smooth boundary.

Bt2—15 to 24 inches; grayish brown (10YR 5/2) silty clay loam; common medium distinct yellowish brown (10YR 5/6) and few fine distinct light brownish gray (2.5Y 6/2) mottles; moderate medium subangular blocky structure; firm; few very fine roots; common faint dark grayish brown (10YR 4/2) clay films and few distinct very dark gray (10YR 3/1) organic coatings on faces of peds; few fine concretions of iron and manganese oxide; medium acid; clear smooth boundary.

Btg1—24 to 32 inches; olive gray (5Y 5/2) silty clay loam; many medium prominent brown (10YR 5/6) and few fine faint light gray (5Y 7/2) mottles; moderate medium subangular blocky structure; firm; few prominent very dark gray (10YR 3/1) organic coatings and few distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine concretions of iron and manganese oxide; slightly acid; gradual smooth boundary.

Btg2—32 to 39 inches; mottled olive gray (5Y 5/2) and yellowish brown (10YR 5/6) silty clay loam; weak medium prismatic structure; firm; few distinct very dark gray (10YR 3/1) organic coatings and dark grayish brown (10YR 4/2) clay films on faces of peds and fillings in root channels; few fine concretions of iron and manganese oxide; neutral; gradual smooth boundary.

BCg—39 to 52 inches; mottled olive gray (5Y 5/2) and yellowish brown (10YR 5/6) silt loam; weak coarse prismatic structure; friable; few distinct very dark gray (10YR 3/1) organic coatings on faces of peds and fillings in root channels; few fine concretions of iron and manganese oxide; neutral; gradual smooth boundary.

Cg—52 to 60 inches; mottled light olive gray (5Y 6/2) and brownish yellow (10YR 6/6) silt loam; massive; friable; few fine concretions of iron and manganese oxide; neutral.

The thickness of the solum ranges from 42 to 55 inches. The Ap horizon has chroma of 1 or 2. The E horizon has value of 4 or 5. The Bt and Btg horizons have value of 4 or 5 and chroma of 2 to 6. The Cg horizon has hue of 7.5YR, 10YR, 2.5Y, or 5Y, value of 5 or 6, and chroma of 2 to 6.

Beaucoup Series

The Beaucoup series consists of poorly drained, moderately slowly permeable soils on flood plains. These soils formed in silty alluvium. Slopes range from 0 to 2 percent.

Typical pedon of Beaucoup silty clay loam, rarely flooded, 840 feet north and 920 feet west of the southeast corner of sec. 22, T. 24 N., R. 7 W.

Ap—0 to 6 inches; very dark grayish brown (10YR 3/2) silty clay loam, gray (10YR 5/1) dry; moderate medium granular structure; firm; few very fine roots; mildly alkaline; abrupt smooth boundary.

A—6 to 11 inches; very dark gray (10YR 3/1) silty clay loam, grayish brown (10YR 5/2) dry; few fine faint dark grayish brown (10YR 4/2) mottles; weak medium subangular blocky structure; firm; few very fine roots; few fine accumulations of iron and manganese oxide; mildly alkaline; clear smooth boundary.

Bg1—11 to 18 inches; dark gray (10YR 4/1) silty clay loam; few fine distinct brown (10YR 4/3) mottles; moderate medium subangular blocky structure; firm; few very fine roots; few fine accumulations of iron and manganese oxide; very slight effervescence; mildly alkaline; clear smooth boundary.

Bg2—18 to 27 inches; dark gray (10YR 4/1) silty clay loam; common medium prominent brown (7.5YR 4/4) mottles; moderate fine subangular blocky structure; firm; few very fine roots; few fine accumulations of iron and manganese oxide; very slight effervescence; mildly alkaline; clear smooth boundary.

Bg3—27 to 38 inches; grayish brown (10YR 5/2) silty clay loam; common medium distinct brown (7.5YR 4/4) and few fine faint pale brown (10YR 6/3) mottles; moderate medium subangular blocky structure; firm; few very fine roots; few fine accumulations of iron and manganese oxide; slight effervescence; mildly alkaline; clear smooth boundary.

Bg4—38 to 48 inches; grayish brown (10YR 5/2) silty clay loam; common medium prominent brown (7.5YR 4/4) and few fine faint pale brown (10YR

6/3) mottles; moderate medium subangular blocky structure; firm; few very fine roots; few fine accumulations of iron and manganese oxide; slight effervescence; mildly alkaline; clear smooth boundary.

Bg5—48 to 60 inches; dark gray (10YR 4/1) silty clay loam; common medium prominent brown (7.5YR 4/4) and few fine faint pale brown (10YR 5/2) mottles; moderate medium subangular blocky structure; firm; slight effervescence; mildly alkaline.

The thickness of the solum ranges from 42 to 65 inches. The thickness of the mollic epipedon ranges from 11 to 20 inches.

The Bg horizon has hue of 10YR, 2.5Y, or 5Y. The C horizon, if it occurs, has hue of 10YR or 5Y, value of 4 to 6, and chroma of 1 or 2. It is dominantly silty clay loam but in some pedons has strata of loam or sandy loam.

Birkbeck Series

The Birkbeck series consists of moderately well drained soils on uplands. These soils formed in loess and in the underlying loamy till. Permeability is moderate in the upper part of the profile and moderately slow in the lower part. Slopes range from 5 to 15 percent.

Typical pedon of Birkbeck silt loam, 5 to 10 percent slopes, eroded, 360 feet north and 24 feet east of the southwest corner of sec. 27, T. 22 N., R. 2 W.

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) silt loam, pale brown (10YR 6/3) dry; mixed with dark yellowish brown (10YR 4/4) silty clay loam in the lower part; weak medium granular structure; friable; few very fine roots; slightly acid; abrupt smooth boundary.

Bt1—7 to 13 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine subangular blocky structure; firm; few very fine roots; common distinct dark brown (10YR 4/3) clay films on faces of peds; medium acid; clear smooth boundary.

Bt2—13 to 19 inches; dark yellowish brown (10YR 4/4) silty clay loam; weak medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots; common faint dark brown (10YR 4/3) clay films on faces of peds; medium acid; clear smooth boundary.

Bt3—19 to 27 inches; dark yellowish brown (10YR 4/4) silty clay loam; few fine faint brown (10YR 5/3) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots; common faint dark brown (10YR 4/3) clay films on faces of peds; medium acid; gradual smooth boundary.

Bt4—27 to 38 inches; yellowish brown (10YR 5/4) silty clay loam; common medium distinct grayish brown (10YR 5/2) and few fine distinct yellowish brown (10YR 5/6) mottles; weak coarse prismatic structure parting to moderate coarse subangular blocky; firm; few very fine roots; common faint dark brown (10YR 4/3) clay films on faces of peds; medium acid; clear smooth boundary.

Bt5—38 to 44 inches; yellowish brown (10YR 5/4) silt loam; common medium faint pale brown (10YR 6/3) and few fine distinct yellowish brown (10YR 5/6) mottles; weak coarse prismatic structure parting to moderate coarse subangular blocky; friable; few very fine roots; few faint dark brown (10YR 4/3) clay films on faces of peds; slightly acid; abrupt smooth boundary.

2BC—44 to 47 inches; yellowish brown (10YR 5/4) loam; weak coarse subangular blocky structure; friable; few distinct very dark grayish brown (10YR 3/2) fillings in root channels; few fine accumulations of iron and manganese oxide; few fine pebbles; neutral; clear smooth boundary.

2C1—47 to 54 inches; yellowish brown (10YR 5/4) loam; massive; friable; few distinct dark grayish brown (10YR 4/2) fillings in root channels; few fine pebbles; neutral; clear smooth boundary.

2C2—54 to 60 inches; yellowish brown (10YR 5/4) loam; massive; friable; few distinct dark grayish brown (10YR 4/2) fillings in root channels; few fine pebbles; strong effervescence; mildly alkaline.

The thickness of the solum ranges from 44 to 65 inches. The thickness of the overlying loess ranges from 40 to 60 inches.

The Ap or A horizon has value of 3 to 5 and chroma of 2 or 3. It is silty clay loam or silt loam. An E horizon occurs in some undisturbed areas. It has hue of 10YR, value of 4 or 5, and chroma of 2 to 4. The 2C horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 or 4. It is loam or silt loam.

Broadwell Series

The Broadwell series consists of well drained soils on uplands. These soils formed in loess and in the underlying sandy material. Permeability is moderate in the upper part of the profile and rapid in the lower part. Slopes range from 1 to 10 percent.

Broadwell silt loam, 5 to 10 percent slopes, eroded, has a surface layer that is slightly thinner than is definitive for the series. This difference, however, does not alter the use or behavior of the soil. The soil is classified as a fine-silty, mixed, mesic Mollic Hapludalf.

Typical pedon of Broadwell silt loam, 1 to 5 percent slopes, 174 feet south and 945 feet east of the center of sec. 28, T. 22 N., R. 3 W.

Ap—0 to 7 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak medium granular structure; friable; few very fine roots; neutral; clear smooth boundary.

A—7 to 10 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate medium granular structure; friable; few very fine roots; neutral; clear smooth boundary.

AB—10 to 13 inches; dark brown (10YR 4/3) silt loam; moderate medium granular structure; friable; few very fine roots; common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; slightly acid; clear smooth boundary.

Bt1—13 to 18 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine and medium subangular blocky structure; firm; few very fine roots; common faint dark yellowish brown (10YR 4/4) clay films and few distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; slightly acid; clear smooth boundary.

Bt2—18 to 27 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium subangular blocky structure; firm; few very fine roots; common faint brown (10YR 4/3) clay films and few distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; slightly acid; clear smooth boundary.

Bt3—27 to 37 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium subangular blocky structure; firm; few very fine roots; common faint dark yellowish brown (10YR 4/4) clay films on faces of peds; slightly acid; gradual smooth boundary.

Bt4—37 to 42 inches; yellowish brown (10YR 5/4) silt loam; weak medium prismatic structure parting to moderate medium subangular blocky; friable; few very fine roots; common faint dark yellowish brown (10YR 4/4) clay films and few distinct dark brown (10YR 3/3) organic coatings on faces of peds; neutral; abrupt smooth boundary.

2Bt5—42 to 48 inches; strong brown (7.5YR 5/6) loamy fine sand; weak coarse subangular blocky structure; very friable; common distinct brown (7.5YR 4/4) clay films on faces of peds; slightly acid; clear smooth boundary.

2C—48 to 60 inches; strong brown (7.5YR 5/6) loamy fine sand; single grain; loose; common distinct brown (7.5YR 4/4) accumulations on sand grains; neutral.

The thickness of the solum ranges from 45 to 55 inches. The thickness of the overlying loess ranges from 40 to 60 inches.

The Ap horizon has chroma of 2 or 3. The Bt horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 to 6. The 2C horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 6. It is loamy fine sand or fine sand.

Camden Series

The Camden series consists of well drained soils on terraces. These soils formed in silty material and in the underlying stratified sediments. Permeability is moderate in the upper part of the profile and moderate or moderately rapid in the lower part. Slopes range from 0 to 5 percent.

Typical pedon of Camden silt loam, 0 to 2 percent slopes, 1,216 feet north and 1,211 feet west of the southeast corner of sec. 25, T. 25 N., R. 2 W.

Ap—0 to 9 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak very fine and fine granular structure; friable; common very fine roots; neutral; abrupt smooth boundary.

E—9 to 16 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak thin and medium platy structure; friable; few very fine and fine roots; common prominent white (10YR 8/2 dry) silt coatings on faces of peds; slightly acid; clear smooth boundary.

Bt1—16 to 23 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine and medium subangular blocky structure; friable; few very fine roots; many distinct brown (10YR 4/3) clay films and few distinct very pale brown (10YR 8/3 dry) silt coatings on faces of peds; neutral; clear smooth boundary.

Bt2—23 to 30 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine subangular blocky structure; friable; few very fine roots; many distinct brown (10YR 4/3) clay films and few distinct very pale brown (10YR 8/3 dry) silt coatings on faces of peds; few fine accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

2Bt3—30 to 44 inches; yellowish brown (10YR 5/4), stratified sandy clay loam and sandy loam; weak medium and coarse subangular blocky structure; friable; few very fine and fine roots; common faint dark yellowish brown (10YR 4/4) clay films on faces of peds; few fine accumulations of iron and manganese oxide; about 2 percent fine gravel; medium acid; clear smooth boundary.

2C1—44 to 51 inches; dark yellowish brown (10YR 4/4) sandy clay loam; massive; firm; few very fine roots; about 5 percent fine and medium gravel; medium acid; abrupt smooth boundary.

2C2—51 to 60 inches; dark yellowish brown (10YR 4/4)

sandy loam having thin strata of material that is more sandy or more clayey; massive; loose and very friable; slightly acid.

The thickness of the solum ranges from 40 to 65 inches. The depth to stratified material ranges from 28 to 38 inches.

The A horizon has value and chroma of 3 or 4. The E horizon, if it occurs, has value of 4 or 5 and chroma of 3 or 4. The Bt horizon has value of 4 or 5 and chroma of 4 to 6. It is silty clay loam or silt loam in the upper part and loam, sandy clay loam, or sandy loam in the lower part. The 2C horizon is stratified gravelly clay loam to sandy loam.

Canisteo Series

The Canisteo series consists of poorly drained, moderately permeable soils on terraces. These soils formed in stratified, calcareous, loamy sediments. Slopes range from 0 to 2 percent.

Typical pedon of Canisteo loam, 1,032 feet south and 402 feet east of the northwest corner of sec. 29, T. 22 N., R. 5 W.

Ap—0 to 8 inches; black (10YR 2/1) loam, dark gray (10YR 4/1) dry; weak very fine granular structure; friable; common very fine roots; strong effervescence; mildly alkaline; abrupt smooth boundary.

A—8 to 17 inches; black (10YR 2/1) loam, dark gray (10YR 4/1) dry; moderate fine granular structure; friable; few very fine roots; slight effervescence; mildly alkaline; gradual smooth boundary.

Bg1—17 to 29 inches; dark grayish brown (2.5Y 4/2) loam; many fine prominent yellowish brown (10YR 5/6) mottles; moderate fine prismatic structure parting to moderate fine subangular blocky; friable; few very fine roots; many distinct very dark gray (10YR 3/1) organic coatings on faces of peds; slight effervescence; mildly alkaline; gradual smooth boundary.

Bg2—29 to 41 inches; dark grayish brown (2.5Y 4/2) loam; many fine prominent yellowish brown (10YR 5/6) mottles; moderate fine and medium prismatic structure parting to moderate fine and medium subangular blocky; friable; few very fine roots; many distinct very dark gray (10YR 3/1) organic coatings on faces of peds; very dark gray (10YR 3/1) krotovinas; very slight effervescence; mildly alkaline; gradual smooth boundary.

Cg—41 to 60 inches; light olive gray (5Y 6/2), stratified silt loam, loam, and sandy loam; many medium prominent yellowish brown (10YR 5/6) mottles; massive; friable; strong effervescence; mildly alkaline.

The thickness of the solum ranges from 35 to 50 inches. The thickness of the mollic epipedon ranges from 15 to 20 inches.

The Ap horizon has value of 2 or 3. The Bg horizon has hue of 2.5Y, 5Y, or 10YR, value of 4 to 6, and chroma of 1 or 2. It is silt loam, silty clay loam, clay loam, loam, or sandy loam. The C horizon has hue of 10YR, 2.5Y, or 5Y. It generally is stratified silt loam, clay loam, loam, or sandy loam. In the sandy substratum phase, however, it is fine sand, sand, or loamy sand.

Casco Series

The Casco series consists of well drained soils on terraces. These soils formed in a thin layer of loamy sediments, which are underlain by calcareous, gravelly and sandy sediments. Permeability is moderate in the upper part of the profile and very rapid in the lower part. Slopes range from 5 to 12 percent.

Typical pedon of Casco clay loam, 5 to 12 percent slopes, severely eroded, 1,145 feet north and 676 feet east of the southwest corner of sec. 36, T. 25 N., R. 2 W.

Ap—0 to 4 inches; brown (10YR 4/3) clay loam; weak very fine granular structure; friable; common very fine roots; medium acid; abrupt smooth boundary.

Bt—4 to 22 inches; brown (7.5YR 4/4) gravelly clay loam; weak fine subangular blocky structure; friable; few very fine roots; few distinct brown (10YR 4/3) clay films on faces of peds; medium acid; abrupt smooth boundary.

2C—22 to 60 inches; dark yellowish brown (10YR 4/4) extremely gravelly loamy sand; single grain; loose; slight effervescence; mildly alkaline.

The solum is 20 to 24 inches thick. The Ap horizon has value of 3 or 4 and chroma of 1 to 3. It is silt loam, silty clay loam, clay loam, or loam. The Bt horizon has hue of 10YR or 7.5YR and chroma of 3 or 4. In the fine-earth fraction, it is silty clay loam, clay loam, loam, or sandy loam. The 2C horizon has value of 4 to 6 and chroma of 3 or 4. It is stratified loamy sand to extremely gravelly loamy sand.

Catlin Series

The Catlin series consists of moderately well drained, moderately permeable soils on uplands. These soils formed in loess and in the underlying glacial till. Slopes range from 4 to 10 percent.

The Catlin soils in this survey area are taxadjuncts

because they have a dark surface layer that is slightly thinner than is definitive for the series. This difference, however, does not alter the use or behavior of the soils. The soils are classified as fine-silty, mixed, mesic Mollic Hapludalfs.

Typical pedon of Catlin silt loam, 4 to 10 percent slopes, eroded, 542 feet north and 1,633 feet west of the southeast corner of sec. 22, T. 24 N., R. 4 W.

Ap—0 to 7 inches; mixed very dark grayish brown (10YR 3/2) and yellowish brown (10YR 5/4) silt loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; common very fine roots; neutral; abrupt smooth boundary.

Bt1—7 to 16 inches; yellowish brown (10YR 5/4) silty clay loam; moderate very fine and fine subangular blocky structure; friable; few very fine roots; common distinct dark brown (10YR 3/3) and brown (10YR 4/3) clay films on faces of peds; few fine accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

Bt2—16 to 22 inches; yellowish brown (10YR 5/4) silty clay loam; few fine distinct yellowish brown (10YR 5/6) mottles; weak fine and medium subangular blocky structure; friable; few very fine roots; common faint brown (10YR 4/3) and few faint dark yellowish brown (10YR 4/4) clay films on faces of peds; common fine accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

Bt3—22 to 29 inches; yellowish brown (10YR 5/4) silty clay loam; common fine distinct strong brown (7.5YR 5/6) and few medium prominent grayish brown (2.5Y 5/2) mottles; weak fine and medium subangular blocky structure; friable; few very fine roots; few faint brown (10YR 4/3) clay films on faces of peds; common fine accumulations of iron and manganese oxide; slightly acid; gradual smooth boundary.

Bt4—29 to 38 inches; yellowish brown (10YR 5/4) silty clay loam; many fine prominent strong brown (7.5YR 5/6) and common fine distinct light brownish gray (10YR 6/2) mottles; weak medium and coarse subangular blocky structure; friable; few very fine roots; few faint brown (10YR 4/3) clay films on faces of peds; brown (10YR 4/3) fillings in root channels; many fine accumulations of iron and manganese oxide; neutral; clear smooth boundary.

Bt5—38 to 43 inches; yellowish brown (10YR 5/4) silt loam; many fine and medium prominent strong brown (7.5YR 5/6) and common fine distinct light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; friable; few faint brown (10YR 4/3) clay films on faces of peds; very dark gray (10YR 3/1) fillings in root channels; many fine accumulations of iron and manganese oxide; neutral; gradual smooth boundary.

2Bt6—43 to 52 inches; mottled yellowish brown (10YR 5/6) and light brownish gray (10YR 6/2) clay loam; few fine distinct light yellowish brown (10YR 6/4) and few fine prominent strong brown (7.5YR 4/6) mottles; massive; friable; few distinct brown (10YR 4/3) clay films on faces of peds; common fine accumulations of iron and manganese oxide; slight effervescence; mildly alkaline; clear smooth boundary.

2C—52 to 60 inches; brown (7.5YR 5/4) loam; few fine distinct strong brown (7.5YR 5/6) mottles; massive; friable; common fine accumulations of iron and manganese oxide; about 5 percent fine and medium gravel; slight effervescence; mildly alkaline.

The thickness of the solum ranges from 45 to 55 inches. The thickness of the loess ranges from 40 to 60 inches.

The Ap horizon has value and chroma of 2 or 3. The Bt horizon has value of 4 or 5 and chroma of 3 or 4. It is silt loam or silty clay loam. The 2Bt horizon has value of 4 or 5 and chroma of 2 to 6. It is clay loam, loam, silty clay loam, or silt loam. The 2C horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 2 to 6. It is loam, silt loam, or clay loam.

Coloma Series

The Coloma series consists of excessively drained, rapidly permeable soils on terraces. These soils formed in sandy windblown material. Slopes range from 3 to 7 percent.

Typical pedon of Coloma sand, 3 to 7 percent slopes, 60 feet south and 1,530 feet west of the northeast corner of sec. 15, T. 23 N., R. 7 W.

Ap—0 to 6 inches; brown (10YR 4/3) sand, pale brown (10YR 6/3) dry; weak fine granular structure; very friable; common very fine roots; neutral; abrupt smooth boundary.

E1—6 to 12 inches; dark yellowish brown (10YR 4/4) sand; weak fine and medium subangular blocky structure; very friable; few very fine roots; neutral; gradual smooth boundary.

E2—12 to 40 inches; yellowish brown (10YR 5/4) sand; weak medium subangular blocky structure; very friable; neutral; gradual smooth boundary.

E&Bt—40 to 60 inches; light yellowish brown (10YR 6/4) sand (E) and lamellae of brown (7.5YR 4/4) loamy sand ½ inch to 3 inches thick (Bt); single grain and loose (E); massive and very friable (Bt); neutral.

Depth to the lamellae ranges from 24 to 45 inches. The Ap horizon has value of 3 or 4. It is loamy fine sand, loamy sand, or sand. The E horizon has value of 4 or 5 and chroma of 4 to 6. It is loamy sand or sand. The E part of the E&Bt horizon has value of 4 or 5 and chroma of 4 to 6. The Bt part has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 6. It is loamy sand or sandy loam. The combined thickness of the lamellae is 1 to 6 inches in the upper 60 inches.

Dakota Series

The Dakota series consists of well drained soils on terraces. These soils formed in loamy sediments and in the underlying sandy material. Permeability is moderate in the upper part of the profile and rapid in the lower part. Slopes range from 0 to 5 percent.

Typical pedon of Dakota loam, 2 to 5 percent slopes, 222 feet north and 967 feet east of the center of sec. 31, T. 24 N., R. 5 W.

Ap—0 to 10 inches; very dark grayish brown (10YR 3/2) loam, grayish brown (10YR 5/2) dry; weak medium granular structure; friable; few very fine roots; slightly acid; abrupt smooth boundary.

BA—10 to 15 inches; dark brown (10YR 3/3) loam, brown (10YR 5/3) dry; moderate fine and medium subangular blocky structure; friable; few very fine roots; many distinct very dark gray (10YR 3/1) organic coatings on faces of peds; neutral; clear smooth boundary.

Bt1—15 to 22 inches; dark yellowish brown (10YR 4/4) clay loam; moderate medium subangular blocky structure; friable; few very fine roots; common distinct very dark gray (10YR 3/1) organic coatings on faces of peds; few faint brown (10YR 4/3) clay films on faces of peds; neutral; clear smooth boundary.

Bt2—22 to 27 inches; dark yellowish brown (10YR 4/4) loam; moderate medium subangular blocky structure; friable; few very fine roots; common faint brown (10YR 4/3) clay films on faces of peds; neutral; clear smooth boundary.

Bt3—27 to 31 inches; dark yellowish brown (10YR 4/4) sandy clay loam; moderate medium subangular blocky structure; friable; few very fine roots; common faint brown (10YR 4/3) clay films on faces of peds; neutral; abrupt smooth boundary.

2Bt4—31 to 37 inches; dark brown (7.5YR 4/4) loamy sand; weak medium subangular blocky structure; very friable; few very fine roots; few distinct dark yellowish brown (10YR 4/4) clay films on sand grains; about 10 to 15 percent fine gravel; neutral; abrupt smooth boundary.

2C1—37 to 44 inches; dark brown (7.5YR 4/4) coarse sand; single grain; loose; less than 5 percent fine gravel; neutral; clear smooth boundary.

2C2—44 to 60 inches; dark brown (7.5YR 4/4) loamy coarse sand; single grain; loose; about 5 percent fine and medium gravel; neutral.

The thickness of the solum ranges from 30 to 40 inches. The thickness of the mollic epipedon ranges from 10 to 18 inches. The thickness of the overlying loamy material ranges from 24 to 40 inches.

The Ap horizon has value of 2 or 3 and chroma of 1 or 2. The Bt horizon has hue of 7.5YR or 10YR and chroma of 3 or 4. It is clay loam, sandy clay loam, loam, or sandy loam. The 2Bt horizon is coarser textured than the Bt horizon and has weaker structure. The 2C horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 6. It is coarse sand, loamy coarse sand, or loamy sand.

Denny Series

The Denny series consists of poorly drained, slowly permeable soils on uplands. These soils formed in loess. Slopes range from 0 to 2 percent.

Typical pedon of Denny silt loam, 2,240 feet south and 660 feet west of the northeast corner of sec. 13, T. 22 N., R. 4 W.

Ap—0 to 9 inches; very dark gray (10YR 3/1) silt loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; few very fine roots; few fine accumulations of iron and manganese oxide; neutral; abrupt smooth boundary.

Eg—9 to 17 inches; light brownish gray (10YR 6/2) silt loam, white (10YR 8/2) dry; moderate medium platy structure; friable; few very fine roots; few distinct dark gray (10YR 4/1) coatings on faces of peds; slightly acid; abrupt smooth boundary.

Btg1—17 to 20 inches; dark gray (10YR 4/1) silty clay loam; common medium prominent strong brown (7.5YR 4/6) mottles; moderate medium subangular blocky structure; firm; few very fine roots; few faint very dark gray (10YR 3/1) organic coatings and few distinct light gray (10YR 7/2 dry) silt coatings on faces of peds; slightly acid; clear smooth boundary.

Btg2—20 to 34 inches; dark gray (10YR 4/1) silty clay; common medium prominent strong brown (7.5YR 4/6) mottles; moderate medium subangular blocky structure; firm; common faint very dark gray (10YR 3/1) organic coatings on faces of peds; few fine concretions of iron and manganese oxide; slightly acid; gradual smooth boundary.

Btg3—34 to 44 inches; grayish brown (10YR 5/2) silty clay loam; common medium prominent yellowish brown (10YR 5/6) mottles; moderate medium

subangular blocky structure; firm; few faint dark gray (10YR 4/1) clay films on faces of peds; few fine concretions of iron and manganese oxide; slightly acid; clear smooth boundary.

Btg4—44 to 60 inches; light olive gray (5Y 6/2) silty clay loam; common medium prominent yellowish brown (10YR 5/6) mottles; weak medium prismatic structure; firm; few prominent dark gray (10YR 4/1) clay films and very dark gray (10YR 3/1) organic coatings on faces of peds; few fine concretions of iron and manganese oxide; neutral.

The thickness of the solum ranges from 45 to 60 inches. The Ap horizon is 8 to 10 inches thick. It has chroma of 1 or 2. The E horizon has value of 4 to 6. The Btg horizon has hue of 10YR, 2.5Y, or 5Y, value of 4 to 6, and chroma of 1 or 2. A C horizon occurs in some pedons. It has hue of 2.5Y or 10YR.

Disco Series

The Disco series consists of somewhat excessively drained soils on terraces. These soils formed in loamy material over sandy material. Permeability is moderately rapid in the upper part of the profile and rapid in the lower part. Slopes range from 0 to 5 percent.

Typical pedon of Disco sandy loam, 0 to 3 percent slopes, 2,055 feet south and 636 feet west of the center of sec. 13, T. 23 N., R. 7 W.

Ap—0 to 7 inches; very dark grayish brown (10YR 3/2) sandy loam, grayish brown (10YR 5/2) dry; weak medium granular structure; very friable; few very fine roots; many faint very dark gray (10YR 3/1) organic coatings on faces of peds; medium acid; abrupt smooth boundary.

A1—7 to 26 inches; very dark brown (10YR 2/2) sandy loam, grayish brown (10YR 5/2) dry; weak fine and medium subangular blocky structure; very friable; few very fine roots; slightly acid; clear smooth boundary.

A2—26 to 34 inches; very dark grayish brown (10YR 3/2) sandy loam, grayish brown (10YR 5/2) dry; weak fine and medium subangular blocky structure; very friable; few very fine roots; medium acid; clear smooth boundary.

Bw—34 to 41 inches; dark brown (10YR 4/3) sandy loam; weak fine and medium subangular blocky structure; friable; few very fine roots; common faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; medium acid; clear smooth boundary.

C—41 to 60 inches; yellowish brown (10YR 5/6) and dark yellowish brown (10YR 4/6) sand; single grain; loose; medium acid.

The thickness of the solum ranges from 40 to 50 inches. The thickness of the mollic epipedon ranges from 24 to 36 inches.

The A horizon has value and chroma of 2 or 3. It is sandy loam or loam. The Bw horizon has value of 3 or 4 and chroma of 2 or 3. The C horizon has value of 4 or 5 and chroma of 4 to 6.

Downs Series

The Downs series consists of moderately well drained, moderately permeable soils on uplands. These soils formed in loess. Slopes range from 1 to 5 percent.

Typical pedon of Downs silt loam, 1 to 5 percent slopes, 260 feet north and 2,450 feet east of the center of sec. 20, T. 23 N., R. 4 W.

Ap—0 to 7 inches; very dark grayish brown (10YR 3/2) silt loam, brown (10YR 5/3) dry; moderate medium granular structure; friable; few very fine roots; slightly acid; clear smooth boundary.

E—7 to 12 inches; grayish brown (10YR 4/2) silt loam; weak thin platy structure parting to moderate very fine subangular blocky; friable; few very fine roots; medium acid; clear smooth boundary.

BE—12 to 18 inches; brown (10YR 4/3) silt loam; moderate very fine and fine subangular blocky structure; friable; few very fine roots; slightly acid; gradual smooth boundary.

Bt1—18 to 29 inches; brown (10YR 4/3) silty clay loam; moderate fine prismatic structure parting to moderate fine and medium subangular blocky; friable; few very fine roots; many faint dark brown (10YR 3/3) clay films on faces of peds; slightly acid; clear smooth boundary.

Bt2—29 to 43 inches; dark yellowish brown (10YR 4/4) silty clay loam; weak fine prismatic structure parting to moderate medium subangular blocky; friable; few very fine roots; many faint brown (10YR 4/3) clay films on faces of peds; few fine accumulations of iron and manganese oxide; medium acid; gradual smooth boundary.

BC—43 to 50 inches; dark brown (10YR 4/4) silty clay loam; common medium distinct yellowish brown (10YR 5/6) mottles; weak very coarse subangular blocky structure; friable; few very fine roots; few fine accumulations of iron and manganese oxide; slightly acid; gradual smooth boundary.

C—50 to 60 inches; yellowish brown (10YR 5/6) silt loam; common medium distinct light brownish gray (10YR 6/2) mottles; massive; firm; few fine accumulations of iron and manganese oxide; neutral.

The thickness of the solum ranges from 45 to more than 60 inches. The Ap horizon has value of 2 or 3 and chroma of 1 or 2. The Bt horizon has value of 4 or 5 and chroma of 3 to 6. It is silty clay loam or silt loam. The C horizon has value of 4 to 6 and chroma of 2 to 6.

Drummer Series

The Drummer series consists of poorly drained, moderately permeable soils on stream terraces. These soils formed in loess or silty material and in the underlying stratified outwash. Slopes range from 0 to 2 percent.

Typical pedon of Drummer silty clay loam, 1,104 feet north and 165 feet east of the southwest corner of sec. 5, T. 21 N., R. 5 W.

Ap—0 to 9 inches; black (N 2/0) silty clay loam, dark gray (10YR 4/1) dry; weak medium subangular blocky structure parting to weak fine granular; friable; few very fine and fine roots; neutral; abrupt smooth boundary.

A—9 to 19 inches; black (N 2/0) silty clay loam, dark gray (10YR 4/1) dry; few fine prominent dark yellowish brown (10YR 3/6) mottles; weak medium subangular blocky structure; friable; few very fine and fine roots; neutral; clear smooth boundary.

Bg1—19 to 24 inches; dark grayish brown (2.5Y 4/2) silty clay loam; common medium prominent dark yellowish brown (10YR 4/6) mottles; moderate fine subangular blocky structure; friable; few very fine roots; many distinct black (N 2/0) organic coatings on faces of peds; neutral; clear smooth boundary.

Bg2—24 to 31 inches; dark grayish brown (2.5Y 4/2) silty clay loam; many medium prominent yellowish brown (10YR 5/8) and brownish yellow (10YR 6/8) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; few very fine roots; common distinct dark gray (10YR 4/1) coatings on faces of peds; neutral; clear smooth boundary.

Bg3—31 to 41 inches; light olive gray (5Y 6/2) silty clay loam; common medium prominent yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure; friable; few very fine roots; common prominent dark gray (10YR 4/1) coatings on faces of peds; black (N 2/0) krotovinas; neutral; clear smooth boundary.

2BCg—41 to 53 inches; light olive gray (5Y 6/2) silt loam; many medium prominent yellowish brown (10YR 5/6) mottles; weak coarse prismatic structure; friable; neutral; abrupt smooth boundary.

2Cg—53 to 60 inches; mottled light olive gray (5Y 6/2), olive (5Y 5/3), and yellowish brown (10YR 5/6), stratified sandy loam, loamy sand, and silt loam; massive; friable; neutral.

The thickness of the solum ranges from 42 to more than 60 inches. The thickness of the loess or silty material ranges from 40 to 60 inches. The thickness of the mollic epipedon ranges from 12 to 24 inches.

The Ap and A horizons have hue of 10YR or 2.5Y or are neutral in hue. They have value of 2 or 3 and chroma of 0 to 2. They are silty clay loam or silt loam. The Bg horizon has hue of 10YR, 2.5Y, or 5Y, value of 3 to 6, and chroma of 1 or 2. The 2BCg horizon has hue of 2.5Y or 5Y, value of 5 or 6, and chroma of 1 or 2. It is silt loam, loam, or sandy loam. The 2Cg horizon is stratified silt loam, loam, sandy loam, or loamy sand.

Edgington Series

The Edgington series consists of poorly drained, slowly permeable soils on uplands. These soils formed in loess. Slopes range from 0 to 2 percent.

Typical pedon of Edgington silt loam, 2,342 feet north and 270 feet west of the southeast corner of sec. 21, T. 22 N., R. 4 W.

Ap—0 to 6 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; weak fine granular structure; friable; few very fine roots; neutral; abrupt smooth boundary.

A1—6 to 11 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; weak fine granular structure; friable; few very fine roots; slightly acid; abrupt smooth boundary.

A2—11 to 15 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; weak thick platy structure parting to weak medium granular; friable; common very fine roots; few distinct light brownish gray (10YR 6/2 dry) silt coatings on faces of peds; slightly acid; abrupt smooth boundary.

Eg—15 to 21 inches; grayish brown (10YR 5/2) silt loam, light brownish gray (10YR 6/2) dry; moderate thin platy structure; friable; few very fine roots; many faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; few fine concretions of iron and manganese oxide; medium acid; abrupt smooth boundary.

EBg—21 to 28 inches; grayish brown (10YR 5/2) silt loam, light brownish gray (10YR 6/2) dry; few fine distinct strong brown (10YR 4/6) mottles; moderate medium subangular structure parting to moderate thin platy; friable; few very fine roots; common faint very dark grayish brown (10YR 3/2) organic coatings and few faint light gray (10YR 7/2 dry) silt coatings on faces of peds; few fine concretions of

iron and manganese oxide; strongly acid; clear smooth boundary.

Btg1—28 to 38 inches; grayish brown (2.5Y 5/2) silty clay loam; common medium prominent strong brown (7.5YR 4/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots; common distinct dark grayish brown (10YR 4/2) clay films, very dark grayish brown (10YR 3/2) organic coatings, and light gray (10YR 7/2 dry) silt coatings on faces of peds; few fine concretions of iron and manganese oxide; strongly acid; clear smooth boundary.

Btg2—38 to 48 inches; grayish brown (2.5Y 5/2) silty clay loam; many medium prominent strong brown (7.5YR 4/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; few distinct dark grayish brown (10YR 4/2) clay films, common distinct very dark grayish brown (10YR 3/2) organic coatings, and few distinct light gray (10YR 7/2 dry) silt coatings on faces of peds; few fine concretions of iron and manganese oxide; strongly acid; clear smooth boundary.

Btg3—48 to 56 inches; mottled grayish brown (2.5YR 5/2) and strong brown (10YR 4/6) silty clay loam; weak medium prismatic structure parting to moderate medium subangular blocky; firm; few distinct dark grayish brown (10YR 4/2) clay films on faces of peds; very dark gray (10YR 3/1) fillings in root channels; few fine concretions of iron and manganese oxide; medium acid; clear smooth boundary.

BC—56 to 60 inches; mottled grayish brown (2.5Y 5/2) and strong brown (7.5YR 4/6) silt loam; weak medium prismatic structure; friable; few fine dark gray (10YR 3/1) fillings in root channels; few fine concretions of iron and manganese oxide; medium acid.

The thickness of the solum ranges from 50 to 60 inches. The thickness of the mollic epipedon ranges from 10 to 15 inches.

The Bt horizon has hue of 2.5Y or 10YR, value of 4 to 6, and chroma of 1 to 6. It is silt loam or silty clay loam.

Elburn Series

The Elburn series consists of somewhat poorly drained, moderately permeable soils on terraces. These soils formed in silty material and in the underlying stratified sediments. Slopes range from 0 to 2 percent.

Typical pedon of Elburn silt loam, 2,302 feet south and 143 feet east of the northwest corner of sec. 11, T. 23 N., R. 4 W.

Ap—0 to 9 inches; very dark brown (10YR 2/2) silt loam, dark grayish brown (10YR 4/2) dry; weak very fine granular structure; friable; many very fine roots; medium acid; abrupt smooth boundary.

A—9 to 21 inches; very dark brown (10YR 2/2) silt loam, dark grayish brown (10YR 4/2) dry; moderate very fine subangular blocky structure; friable; many very fine roots; neutral; clear smooth boundary.

Bt1—21 to 32 inches; brown (10YR 4/3) silt loam; common fine faint dark grayish brown (10YR 4/2) and common fine distinct yellowish brown (10YR 5/6) mottles; moderate fine prismatic structure parting to moderate fine subangular blocky; friable; common very fine roots; common faint dark grayish brown (10YR 4/2) clay films on faces of peds; many faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; common fine accumulations of iron and manganese oxide; neutral; gradual smooth boundary.

Bt2—32 to 40 inches; yellowish brown (10YR 5/4) silty clay loam; common fine distinct grayish brown (10YR 5/2) and yellowish brown (10YR 5/6) mottles; moderate fine and medium prismatic structure parting to moderate fine and medium subangular blocky; friable; few very fine roots; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; many distinct very dark grayish brown (10YR 3/2) and dark brown (10YR 3/3) organic coatings on faces of peds; common fine accumulations of iron and manganese oxide; slightly acid; gradual smooth boundary.

Bt3—40 to 53 inches; light olive brown (2.5Y 5/4) silty clay loam; common fine distinct grayish brown (2.5Y 5/2) and common fine prominent yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure; friable; few very fine roots; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common distinct dark brown (10YR 3/3) organic coatings on faces of peds; common fine accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

Bt4—53 to 59 inches; light olive brown (2.5Y 5/4) silt loam; common medium prominent yellowish brown (10YR 5/6) and grayish brown (2.5Y 5/2) mottles; weak coarse prismatic structure; friable; few distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common fine accumulations of iron and manganese oxide; slightly acid; gradual smooth boundary.

BC—59 to 76 inches; light olive brown (2.5Y 5/4) silt loam; common medium prominent yellowish brown (10YR 5/6) and common medium distinct grayish brown (2.5Y 5/2) mottles; weak coarse prismatic structure; friable; common fine accumulations of

iron and manganese oxide; slightly acid; gradual smooth boundary.

2C—76 to 84 inches; light olive brown (2.5Y 5/4), stratified silt loam, silty clay loam, and loam; common medium prominent yellowish brown (10YR 5/6) and common coarse distinct grayish brown (2.5Y 5/2) mottles; massive; friable; common fine accumulations of iron and manganese oxide; slightly acid.

The thickness of the solum ranges from 50 to 76 inches. The A horizon has value of 2 or 3 and chroma of 1 or 2. The 2C horizon, if it occurs, has hue of 10YR or 2.5YR, value of 5 or 6, and chroma 2 to 6. It is stratified silt loam, silty clay loam, loam, or very fine sandy loam.

Fayette Series

The Fayette series consists of well drained, moderately permeable soils on uplands. These soils formed in loess. Slopes range from 5 to 10 percent.

Typical pedon of Fayette silt loam, 5 to 10 percent slopes, eroded, 626 feet south and 774 feet west of the northeast corner of sec. 4, T. 23 N., R. 4 W.

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) silt loam, grayish brown (10YR 5/2) dry; mixed with yellowish brown (10YR 5/4) silt loam in the lower part; weak very fine and fine granular structure; friable; common very fine roots; neutral; clear smooth boundary.

Bt1—7 to 11 inches; yellowish brown (10YR 5/4) silt loam, light yellowish brown (10YR 6/4) dry; weak fine subangular blocky structure; friable; common very fine roots; dark grayish brown (10YR 4/2) fillings in channels; slightly acid; clear smooth boundary.

Bt2—11 to 25 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium subangular blocky structure; friable; few very fine roots; many faint dark yellowish brown (10YR 4/4) clay films and common distinct white (10YR 8/2 dry) silt coatings on faces of peds; medium acid; gradual smooth boundary.

Bt3—25 to 31 inches; yellowish brown (10YR 5/6) silty clay loam; weak fine prismatic structure parting to moderate fine subangular blocky; friable; few very fine roots; many distinct dark yellowish brown (10YR 4/4) clay films and few distinct white (10YR 8/2 dry) silt coatings on faces of peds; few fine accumulations of iron and manganese oxide; strongly acid; gradual smooth boundary.

Bt4—31 to 40 inches; yellowish brown (10YR 5/6) silty clay loam; few fine prominent strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; friable; few very fine roots; common distinct dark yellowish brown (10YR 4/4) clay films and few distinct white (10YR 8/2 dry) silt coatings on faces of peds; few fine accumulations of iron and manganese oxide; strongly acid; gradual smooth boundary.

Bt5—40 to 57 inches; yellowish brown (10YR 5/4) silty clay loam; few fine distinct yellowish brown (10YR 5/6) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; friable; few very fine roots; few faint dark yellowish brown (10YR 4/4) clay films and few distinct white (10YR 8/2 dry) silt coatings on faces of peds; few fine accumulations of iron and manganese oxide; strongly acid; gradual smooth boundary.

BC—57 to 60 inches; yellowish brown (10YR 5/4) silt loam; weak medium subangular blocky structure; friable; medium acid.

The thickness of the solum ranges from 50 to 65 inches. The Ap horizon has value of 3 to 5 and chroma of 2 to 4. The E horizon, if it occurs, has value of 4 to 7 and chroma of 3 or 4. The Bt horizon has value of 4 or 5. The BC horizon has value of 4 or 5 and chroma of 4 to 6.

Gilford Series

The Gilford series consists of poorly drained soils on outwash plains and lake plains. These soils formed in glacial outwash. Permeability is moderately rapid in the upper part of the profile and rapid in the lower part. Slopes range from 0 to 2 percent.

Typical pedon of Gilford sandy loam, 1,094 feet south and 2,250 feet east of the northwest corner of sec. 27, T. 22 N., R. 6 W.

Ap—0 to 9 inches; black (10YR 2/1) sandy loam, dark grayish brown (10YR 4/2) dry; weak medium subangular blocky structure parting to weak fine granular; friable; common very fine roots; slightly acid; clear smooth boundary.

A—9 to 15 inches; very dark gray (10YR 3/1) sandy loam, grayish brown (10YR 5/2) dry; weak medium subangular blocky structure parting to weak fine granular; friable; few very fine roots; common faint black (10YR 2/1) organic coatings on faces of peds; few medium dark concretions of iron and manganese oxide; neutral; gradual smooth boundary.

Bg—15 to 27 inches; dark grayish brown (2.5Y 4/2) sandy loam; many coarse faint grayish brown (2.5Y 5/2), common fine distinct light olive brown (2.5Y 5/4), and few fine prominent strong brown (7.5YR

5/6) mottles; weak medium subangular blocky structure; friable; few very fine roots; many distinct very dark gray (10YR 3/1) organic coatings on faces of peds; neutral; gradual smooth boundary.

2BCg—27 to 36 inches; dark grayish brown (2.5Y 4/2) loamy sand; many medium faint grayish brown (2.5Y 5/2), few fine prominent strong brown (7.5YR 5/6), and few fine distinct light olive brown (2.5Y 5/4) mottles; weak fine and medium subangular blocky structure; very friable; few very fine roots; common distinct very dark gray (10YR 3/1) organic coatings on faces of peds; neutral; clear smooth boundary.

2Cg1—36 to 48 inches; light brownish gray (2.5Y 6/2) sand; many medium faint grayish brown (2.5Y 5/2), common medium prominent yellowish brown (10YR 5/6), and few fine distinct light olive brown (2.5Y 5/4) mottles; single grain; loose; few very fine roots; neutral; clear smooth boundary.

2Cg2—48 to 60 inches; mottled yellowish brown (10YR 5/6) and light brownish gray (2.5Y 6/2) sand; single grain; loose; neutral.

The thickness of the solum ranges from 30 to 40 inches. The thickness of the mollic epipedon ranges from 10 to 24 inches.

The Ap and A horizons have hue of 10YR or 2.5Y or are neutral in hue. They have chroma of 0 to 2. The Bg horizon has hue of 10YR, 2.5Y, or 5Y, value of 4 to 6, and chroma of 1 or 2. The 2Cg horizon is sand or loamy sand.

Harpster Series

The Harpster series consists of poorly drained, moderately permeable soils on uplands. These soils formed in calcareous, silty material. Slopes range from 0 to 2 percent.

Typical pedon of Harpster silty clay loam, 936 feet north and 321 feet east of the center of sec. 14, T. 23 N., R. 2 W.

Ap—0 to 7 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; weak fine granular structure; firm; few very fine roots; few snail shell fragments; violent effervescence; moderately alkaline; abrupt smooth boundary.

Ak—7 to 12 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; weak very fine and fine subangular blocky structure; firm; few very fine roots; many faint very dark gray (10YR 3/1) organic coatings on faces of peds; few fine concretions of calcium carbonate; few snail shell fragments; violent effervescence; moderately alkaline; clear smooth boundary.

Bkg1—12 to 17 inches; dark gray (10YR 4/1) silty clay loam; few fine prominent grayish brown (2.5Y 5/2) mottles; moderate fine subangular blocky structure; firm; few very fine roots; many fine accumulations of calcium carbonate; few snail shell fragments; violent effervescence; moderately alkaline; clear smooth boundary.

Bkg2—17 to 22 inches; grayish brown (2.5Y 5/2) silty clay loam; few fine prominent yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; few very fine roots; many fine accumulations of calcium carbonate; few snail shell fragments; violent effervescence; moderately alkaline; clear smooth boundary.

Bkg3—22 to 30 inches; light brownish gray (2.5Y 6/2) silt loam; common fine prominent yellowish brown (10YR 5/6) mottles; massive; friable; few very fine roots; many fine accumulations of calcium carbonate; few snail shell fragments; violent effervescence; moderately alkaline; clear smooth boundary.

Bkg4—30 to 42 inches; light brownish gray (2.5Y 6/2) silt loam; many medium prominent brownish yellow (10YR 6/6) mottles; massive; friable; many fine accumulations of calcium carbonate; few snail shell fragments; violent effervescence; moderately alkaline; clear smooth boundary.

Cg—42 to 60 inches; gray (10YR 6/1) silt loam; many medium prominent yellowish brown (10YR 5/6) and common medium prominent yellowish brown (10YR 5/8) mottles; massive; friable; few snail shell fragments; few concretions of iron and manganese oxide; violent effervescence; moderately alkaline.

The thickness of the solum ranges from 22 to 45 inches. The thickness of the mollic epipedon ranges from 10 to 14 inches.

The A horizon has hue of 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 or 1. The Bkg horizon has value of 4 to 6. The Cg horizon has hue of 7.5YR, 10YR, or 2.5Y, value of 5 or 6, and chroma of 1 to 8. It is silt loam, loam, or silty clay loam.

Hennepin Series

The Hennepin series consists of well drained, moderately slowly permeable soils on uplands. These soils formed in calcareous glacial till. Slopes range from 20 to 60 percent.

Typical pedon of Hennepin loam, in an area of Miami-Hennepin complex, 30 to 60 percent slopes, 400 feet north and 2,100 feet east of the center of sec. 5, T. 25 N., R. 4 W.

A—0 to 5 inches; very dark grayish brown (10YR 3/2) loam, grayish brown (10YR 5/2) dry; moderate medium granular structure; friable; common fine roots; few pebbles; neutral; clear smooth boundary.

BA—5 to 10 inches; brown (10YR 4/3) loam; weak medium subangular blocky structure parting to weak fine granular; friable; common fine roots; common faint dark brown (10YR 3/3) organic coatings on faces of peds; common pebbles; violent effervescence; mildly alkaline; clear smooth boundary.

Bw—10 to 16 inches; yellowish brown (10YR 5/4) loam; weak medium subangular blocky structure; firm; few fine roots; common pebbles; strong effervescence; mildly alkaline; clear smooth boundary.

C—16 to 60 inches; yellowish brown (10YR 5/4) loam; massive; firm; few fine roots; common pebbles; violent effervescence; moderately alkaline.

The thickness of the solum ranges from 10 to 20 inches. The A horizon has value of 3 or 4 and chroma of 1 or 2. The Bw horizon has value of 4 or 5 and chroma of 3 or 4. It is loam or clay loam. The C horizon has chroma of 3 or 4. It is loam or silt loam.

Houghton Series

The Houghton series consists of very poorly drained, moderately permeable soils on terraces and flood plains. These soils formed in organic material. Slopes range from 0 to 2 percent.

Typical pedon of Houghton muck, 340 feet south and 1,720 feet west of the northeast corner of sec. 30, T. 24 N., R. 5 W.

Op—0 to 10 inches; sapric material (muck), black (N 2/0) rubbed; about 4 percent fiber, 1 percent rubbed; weak fine subangular blocky structure; many very fine roots; neutral; abrupt smooth boundary.

Oa1—10 to 17 inches; sapric material (muck), dark reddish brown (5YR 3/3) broken face, black (N 2/0) rubbed; about 4 percent fiber, 1 percent rubbed; moderate medium subangular blocky structure; common very fine roots; neutral; clear smooth boundary.

Oa2—17 to 26 inches; sapric material (muck), dark reddish brown (5YR 3/3) broken face, black (N 2/0) rubbed; about 8 percent fiber, 2 percent rubbed; moderate medium subangular blocky structure; few very fine roots; neutral; clear smooth boundary.

Oa3—26 to 34 inches; sapric material (muck), dark reddish brown (5YR 3/3) broken face, black (N 2/0) rubbed; about 12 percent fiber, 2 percent rubbed; weak medium subangular blocky structure; few very fine roots; neutral; clear smooth boundary.

Oa4—34 to 60 inches; sapric material (muck), dark reddish brown (5YR 2.5/2) broken face, black (N 2/0) rubbed; about 4 percent fiber, 2 percent rubbed; massive; few very fine roots; neutral.

The sapric material is more than 51 inches thick. It has hue of 5YR or 10YR or is neutral in hue. It has value of 2 or 3.

Huntsville Series

The Huntsville series consists of well drained, moderately permeable soils on flood plains. These soils formed in silty alluvium. Slopes range from 0 to 2 percent.

Typical pedon of Huntsville silt loam, frequently flooded, 319 feet south and 561 feet east of the northwest corner of sec. 19, T. 24 N., R. 5 W.

Ap—0 to 8 inches; very dark gray (10YR 3/1) silt loam; weak very fine granular structure; friable; few very fine roots; neutral; clear smooth boundary.

A1—8 to 24 inches; very dark gray (10YR 3/1) silt loam; moderate very fine granular structure; friable; few very fine roots; compacted zone between depths of 8 and 10 inches; neutral; clear smooth boundary.

A2—24 to 43 inches; very dark grayish brown (10YR 3/2) silt loam; moderate fine prismatic structure parting to moderate very fine subangular blocky; friable; many faint very dark gray (10YR 3/1) organic coatings on faces of peds; mildly alkaline; gradual smooth boundary.

AC—43 to 60 inches; brown (10YR 4/3) silt loam; moderate fine prismatic structure parting to moderate fine subangular blocky; friable; many faint dark brown (10YR 3/3) organic coatings on faces of peds; mildly alkaline.

The thickness of the solum ranges from 40 to more than 60 inches. The thickness of the mollic epipedon ranges from 24 to 54 inches.

The A horizon has value of 2 or 3 and chroma of 1 to 3. Some pedons have a C horizon within a depth of 60 inches. This horizon is silt loam. It has value and chroma of 3 or 4.

Ipava Series

The Ipava series consists of somewhat poorly drained, moderately slowly permeable soils on uplands. These soils formed in loess. Slopes range from 0 to 2 percent.

Typical pedon of Ipava silt loam, 234 feet west and 1,320 feet south of the northeast corner of sec. 36, T. 24 N., R. 4 W.

Ap—0 to 8 inches; very dark gray (10YR 3/1) silt loam, dark grayish brown (10YR 4/2) dry; moderate fine granular structure; friable; common fine roots; slightly acid; abrupt smooth boundary.

A—8 to 18 inches; very dark gray (10YR 3/1) silt loam, dark grayish brown (10YR 4/2) dry; moderate medium granular structure; friable; few fine roots; slightly acid; clear smooth boundary.

BA—18 to 22 inches; dark grayish brown (10YR 4/2) silty clay loam; moderate fine and medium subangular blocky structure; friable; few fine roots; many faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; few fine concretions of iron and manganese oxide; neutral; clear smooth boundary.

Bt1—22 to 29 inches; dark grayish brown (2.5Y 4/2) silty clay loam; few fine prominent yellowish brown (10YR 5/6) mottles; weak fine prismatic structure parting to moderate medium subangular blocky; friable; few fine roots; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few distinct very dark grayish brown (10YR 3/2) organic coatings lining pores; few fine concretions of iron and manganese oxide; neutral; clear smooth boundary.

Bt2—29 to 40 inches; light olive brown (2.5Y 5/4) silty clay loam; common fine prominent yellowish brown (10YR 5/6) and few fine distinct dark grayish brown (2.5Y 4/2) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; friable; few fine roots; many prominent dark grayish brown (10YR 4/2) clay films on faces of peds; few prominent very dark grayish brown (10YR 3/2) organic coatings lining pores; common fine concretions of iron and manganese oxide; neutral; gradual smooth boundary.

BC—40 to 51 inches; light olive brown (2.5Y 5/4) silty clay loam; common fine prominent yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; few fine roots; many prominent dark grayish brown (10YR 4/2) clay films on faces of peds; few prominent very dark grayish brown (10YR 3/2) organic coatings lining pores; common medium concretions of iron and manganese oxide; neutral; gradual smooth boundary.

C—51 to 60 inches; light olive brown (2.5Y 5/4) silt loam; common fine prominent yellowish brown (10YR 5/6) mottles; massive; friable; few medium concretions of iron and manganese oxide; neutral.

The thickness of the solum ranges from 46 to 60 inches. The thickness of the mollic epipedon ranges from 10 to 20 inches.

The Ap horizon has value of 2 or 3 and chroma of 1 or 2. The Bt horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 4. The C horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 to 8.

Jasper Series

The Jasper series consists of well drained soils on terraces. These soils formed in loamy sediments over sandy material. Permeability is moderate in the upper part of the profile and rapid in the lower part. Slopes range from 0 to 2 percent.

Typical pedon of Jasper loam, sandy substratum, 255 feet south and 2,346 feet west of the northeast corner of sec. 28, T. 24 N., R. 5 W.

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) loam, grayish brown (10YR 5/2) dry; weak medium granular structure; friable; few very fine roots; medium acid; abrupt smooth boundary.

A—8 to 15 inches; very dark grayish brown (10YR 3/2) loam, grayish brown (10YR 5/2) dry; weak fine subangular blocky structure; friable; few very fine roots; medium acid; clear smooth boundary.

AB—15 to 18 inches; dark brown (10YR 3/3) loam, brown (10YR 5/3) dry; weak fine and medium subangular blocky structure; friable; few very fine roots; common faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; medium acid; clear smooth boundary.

Bt1—18 to 27 inches; dark brown (10YR 4/3) clay loam; moderate medium subangular blocky structure; friable; few very fine roots; common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; medium acid; clear smooth boundary.

Bt2—27 to 34 inches; dark yellowish brown (10YR 4/4) loam; moderate medium subangular blocky structure; friable; few very fine roots; common faint brown (10YR 4/3) clay films on faces of peds; slightly acid; clear smooth boundary.

Bt3—34 to 46 inches; brown (7.5YR 4/4) loam; moderate medium subangular blocky structure; friable; few very fine roots; common distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; slightly acid; abrupt smooth boundary.

C—46 to 60 inches; brown (7.5YR 4/4) loamy sand and sand; massive; very friable; neutral.

The thickness of the solum ranges from 40 to 48 inches. The thickness of the mollic epipedon ranges from 10 to 18 inches.

The A horizon has chroma of 1 to 3. It is loam or fine sandy loam. The Bt horizon has value of 4 or 5 and

chroma of 3 to 5. It is silty clay loam, clay loam, sandy clay loam, loam, or sandy loam. The C horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 6.

Jules Series

The Jules series consists of moderately well drained, moderately permeable soils on flood plains. These soils formed in stratified, silty alluvium. Slopes range from 0 to 2 percent.

Typical pedon of Jules silt loam, occasionally flooded, 2,327 feet west and 39 feet north of the southeast corner of sec. 2, T. 26 N., R. 4 W.

Ap—0 to 10 inches; brown (10YR 5/3) silt loam, pale brown (10YR 6/3) dry; moderate fine granular structure; friable; few fine roots; the sand fraction occurring as fine sand and very fine sand; strong effervescence; moderately alkaline; abrupt smooth boundary.

C1—10 to 25 inches; stratified brown (10YR 5/3), pale brown (10YR 6/3), and light yellowish brown (10YR 6/4) silt; massive; friable; few fine roots; common yellowish red (5YR 5/8) accumulations of iron; thin strata of sandy loam at a depth of about 11 inches; strong effervescence; moderately alkaline; clear wavy boundary.

C2—25 to 39 inches; grayish brown (10YR 5/2) silt loam; massive; friable; few fine roots; few prominent dark brown (7.5YR 3/2) organic coatings on faces of peds; common yellowish red (5YR 5/8) accumulations of iron; few thin brown (10YR 5/3) strata; strong effervescence; moderately alkaline; clear wavy boundary.

C3—39 to 60 inches; grayish brown (10YR 5/2) and brown (10YR 5/3) silt loam; massive; friable; few thin strata of yellowish brown (10YR 5/4) loam, sandy loam, and loamy sand; common yellowish red (5YR 5/8) accumulations of iron; strong effervescence; moderately alkaline.

The thickness of the solum ranges from 0 to 10 inches. The Ap horizon has value of 4 or 5 and chroma of 2 or 3. The C horizon has value of 3 to 5 and chroma of 2 to 4.

La Hogue Series

The La Hogue series consists of somewhat poorly drained soils on terraces. These soils formed in loamy sediments. Permeability is moderate in the upper part of the profile and moderately rapid in the lower part. Slopes range from 0 to 2 percent.

Typical pedon of La Hogue loam, 1,350 feet south and 915 feet west of the center of sec. 3, T. 23 N., R. 5 W.

Ap—0 to 7 inches; very dark gray (10YR 3/1) loam, grayish brown (10YR 5/2) dry; weak fine granular structure; firm; few very fine roots; neutral; abrupt smooth boundary.

A1—7 to 13 inches; black (10YR 2/1) loam, gray (10YR 5/1) dry; moderate medium granular structure; firm; few very fine roots; neutral; clear smooth boundary.

A2—13 to 22 inches; very dark gray (10YR 3/1) loam, gray (10YR 5/1) dry; moderate fine subangular blocky structure; friable; few very fine roots; slightly acid; clear smooth boundary.

Bt1—22 to 27 inches; dark grayish brown (10YR 4/2) clay loam; few fine distinct yellowish brown (10YR 5/4) mottles; moderate medium angular blocky structure; firm; few very fine roots; many distinct very dark gray (10YR 3/1) organic coatings on faces of peds; few fine accumulations of iron and manganese oxide; medium acid; clear smooth boundary.

Bt2—27 to 37 inches; dark brown (10YR 4/3) clay loam; common medium distinct yellowish brown (10YR 5/6) and few fine faint grayish brown (10YR 5/2) mottles; moderate medium angular blocky structure; firm; few very fine roots; many distinct very dark gray (10YR 3/1) organic coatings on faces of peds; few fine accumulations of iron and manganese oxide; medium acid; gradual smooth boundary.

Bt3—37 to 44 inches; dark yellowish brown (10YR 4/4) sandy clay loam; common medium distinct yellowish brown (10YR 5/6) and few fine distinct grayish brown (10YR 5/2) mottles; moderate medium prismatic structure parting to weak medium subangular blocky; firm; few very fine roots; common prominent dark brown (7.5YR 3/2) and common distinct very dark gray (10YR 3/1) organic coatings on faces of peds; few fine accumulations of iron and manganese oxide; medium acid; clear smooth boundary.

BC—44 to 51 inches; brown (10YR 4/3) sandy loam; few fine distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; few very fine roots; common prominent dark brown (7.5YR 3/2) organic coatings on faces of peds; medium acid; clear smooth boundary.

C—51 to 60 inches; stratified brown (10YR 5/3) sand and loamy sand and dark brown (7.5YR 3/2) sandy loam; single grain and massive; loose and very friable; slightly acid.

The thickness of the solum ranges from 45 to 60 inches. The thickness of the mollic epipedon ranges from 10 to 22 inches.

The A horizon has chroma of 1 or 2. The Bt horizon has hue of 10YR or 2.5Y and value of 4 or 5. It is loam, sandy loam, clay loam, or sandy clay loam. The C horizon has hue of 7.5YR, 10YR, or 2.5Y and value of 5 or 6. It is stratified loam, sandy loam, loamy sand, or sand.

Landes Series

The Landes series consists of well drained soils on flood plains. These soils formed in loamy alluvium. Permeability is moderate in the upper part of the profile and rapid in the lower part. Slopes range from 0 to 2 percent.

Typical pedon of Landes fine sandy loam, frequently flooded, 1,080 feet south and 220 feet east of the northwest corner of sec. 3, T. 24 N., R. 2 W.

Ap—0 to 5 inches; very dark grayish brown (10YR 3/2) fine sandy loam, grayish brown (10YR 5/2) dry; weak fine subangular blocky structure parting to weak fine granular; friable; common very fine roots; neutral; abrupt smooth boundary.

A—5 to 12 inches; very dark gray (10YR 3/1) fine sandy loam, dark grayish brown (10YR 4/2) dry; weak fine and medium subangular blocky structure; friable; few very fine roots; few faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; neutral; clear smooth boundary.

AB—12 to 21 inches; very dark grayish brown (10YR 3/2) fine sandy loam, dark grayish brown (10YR 4/2) dry; weak fine and medium subangular blocky structure; friable; few very fine roots; neutral; gradual smooth boundary.

Bw1—21 to 32 inches; brown (10YR 4/3) fine sandy loam; weak fine and medium subangular blocky structure; very friable; few fine roots; common faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; neutral; gradual smooth boundary.

Bw2—32 to 39 inches; brown (10YR 4/3) fine sandy loam; weak fine and medium subangular blocky structure; friable; few very fine roots; mildly alkaline; gradual smooth boundary.

C1—39 to 50 inches; brown (10YR 5/3) loamy fine sand; single grain; loose; few very fine roots; many faint dark grayish brown (10YR 4/2) coatings lining pores; mildly alkaline; gradual smooth boundary.

C2—50 to 60 inches; brown (10YR 4/3) fine sandy loam; massive; friable; few very fine roots; common faint very dark grayish brown (10YR 3/2) coatings lining pores; neutral.

The thickness of the solum ranges from 30 to 40 inches. The thickness of the mollic epipedon ranges from 10 to 24 inches.

The A horizon has value of 2 or 3 and chroma of 1 to 3. The Bw horizon has value of 3 or 4 and chroma of 2 or 3. It is fine sandy loam or loamy fine sand. The C horizon has chroma of 3 or 4. It is stratified fine sandy loam, loamy fine sand, fine sand, or sand.

Lawson Series

The Lawson series consists of somewhat poorly drained, moderately permeable soils on flood plains. These soils formed in silty alluvium. Slopes range from 0 to 2 percent.

Typical pedon of Lawson silt loam, frequently flooded, 621 feet west and 245 feet north of the southeast corner of sec. 24, T. 24 N., R. 6 W.

Ap—0 to 11 inches; very dark gray (10YR 3/1) silt loam, dark grayish brown (10YR 4/2) dry; moderate fine and medium granular structure; friable; common very fine roots; neutral; abrupt smooth boundary.

A1—11 to 18 inches; black (10YR 2/1) silt loam, dark grayish brown (10YR 4/2) dry; moderate medium granular structure; friable; common very fine roots; neutral; clear smooth boundary.

A2—18 to 32 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; moderate fine subangular blocky structure; friable; common very fine roots; neutral; gradual wavy boundary.

AC—32 to 40 inches; dark grayish brown (10YR 4/2) silty clay loam, grayish brown (10YR 5/2) dry; common fine prominent dark yellowish brown (10YR 4/6) mottles; weak fine prismatic structure parting to moderate fine subangular blocky; friable; common very fine roots; many faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; neutral; clear wavy boundary.

C1—40 to 55 inches; dark grayish brown (2.5Y 4/2) loam that has strata of sandy loam and silt loam; common medium prominent yellowish brown (10YR 5/6) mottles; weak medium prismatic structure; friable; slight effervescence; mildly alkaline; gradual wavy boundary.

C2—55 to 60 inches; light brownish gray (2.5Y 6/2) loam that has strata of sandy loam; many medium prominent yellowish brown (10YR 5/6) mottles; massive; friable; slight effervescence; mildly alkaline.

The thickness of the solum ranges from 40 to 55 inches. The thickness of the mollic epipedon ranges from 24 to 40 inches.

The A horizon has chroma of 1 or 2. The C horizon

has value of 4 to 6 and chroma of 1 to 3. It is silt loam, silty clay loam, loam, or sandy loam.

Miami Series

The Miami series consists of well drained soils on uplands. These soils formed in glacial till. Permeability is moderate in the upper part of the profile and moderately slow in the lower part. Slopes are 5 to 15 percent or 20 to 60 percent.

Typical pedon of Miami silt loam, 10 to 15 percent slopes, eroded, 132 feet north and 1,696 feet east of the southwest corner of sec. 33, T. 24 N., R. 3 W.

Ap—0 to 7 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; mixed with some yellowish brown (10YR 5/4) BE material in the lower part; weak fine granular structure; friable; few very fine roots; slightly acid; abrupt smooth boundary.

BE—7 to 11 inches; yellowish brown (10YR 5/4) silty clay loam; moderate very fine and fine subangular blocky structure; friable; few very fine roots; many faint dark yellowish brown (10YR 4/4) clay films and few distinct light gray (10YR 7/2 dry) silt coatings on faces of peds; slightly acid; clear smooth boundary.

2Bt1—11 to 16 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine subangular blocky structure; friable; few very fine roots; many faint dark yellowish brown (10YR 4/4) clay films on faces of peds; few fine accumulations of iron and manganese oxide; about 3 percent fine and medium gravel; medium acid; clear smooth boundary.

2Bt2—16 to 27 inches; yellowish brown (10YR 5/4) clay loam; weak medium subangular blocky structure parting to moderate fine subangular blocky; firm; few very fine roots; many faint dark yellowish brown (10YR 4/4) clay films on faces of peds; common fine accumulations of iron and manganese oxide; about 3 percent fine gravel; medium acid; clear smooth boundary.

2BC—27 to 39 inches; yellowish brown (10YR 5/4) loam; weak fine prismatic structure parting to weak medium subangular blocky; firm; few very fine roots; few faint dark yellowish brown (10YR 4/4) clay films on faces of peds; few fine and medium concretions of iron and manganese oxide; about 8 percent fine and medium gravel; slight effervescence; mildly alkaline; gradual smooth boundary.

2C—39 to 60 inches; yellowish brown (10YR 5/4) loam that has a stratum of strong brown (7.5YR 5/8) very fine sandy loam about 1 inch thick; massive; firm; few medium and coarse accumulations of iron and manganese oxide; about 5 percent fine and medium gravel; strong effervescence; mildly alkaline.

The thickness of the solum ranges from 30 to 40 inches. The thickness of the overlying loess ranges from 0 to 18 inches.

The Ap horizon has value of 3 or 4 and chroma of 2 to 4. It is silt loam or loam. Some pedons have an E horizon. This horizon has value of 4 or 5 and chroma of 3 or 4. It is silt loam, silty clay loam, or loam. The 2Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 to 6. The 2C horizon has hue of 10YR or 7.5YR. It is clay loam, silt loam, or loam.

Ockley Series

The Ockley series consists of well drained soils on terraces. These soils formed in loamy, sandy, and gravelly sediments. Permeability is moderate in the upper part of the profile and very rapid in the lower part. Slopes range from 0 to 2 percent.

Typical pedon of Ockley sandy loam, 0 to 2 percent slopes, 392 feet north and 945 feet west of the southeast corner of sec. 17, T. 23 N., R. 4 W.

Ap—0 to 11 inches; brown (10YR 4/3) sandy loam, pale brown (10YR 6/3) dry; weak thin platy structure parting to weak very fine granular; friable; common very fine roots; very strongly acid; abrupt smooth boundary.

E—11 to 18 inches; brown (10YR 4/3) fine sandy loam, very pale brown (10YR 7/3) dry; moderate thin and medium platy structure; friable; few very fine roots; strongly acid; clear smooth boundary.

Bt1—18 to 29 inches; dark yellowish brown (10YR 4/4) loam; moderate fine prismatic structure parting to moderate fine subangular blocky; friable; few very fine roots; many faint brown (10YR 4/3) clay films on faces of peds; medium acid; gradual smooth boundary.

Bt2—29 to 36 inches; dark yellowish brown (10YR 4/4) clay loam; moderate medium prismatic structure; friable; few very fine roots; common faint brown (10YR 4/3) clay films on faces of peds; medium acid; clear smooth boundary.

2Bt3—36 to 50 inches; dark brown (7.5YR 3/4) gravelly clay loam; weak coarse prismatic structure; friable; few distinct brown (10YR 4/3) clay films on faces of peds; about 25 percent gravel; slightly acid; abrupt smooth boundary.

2C—50 to 60 inches; brown (10YR 4/3) extremely gravelly loamy sand; single grain; loose; about 75 percent gravel; strong effervescence; moderately alkaline.

The thickness of the solum ranges from 40 to 55 inches. The Ap horizon has value of 3 or 4 and chroma of 2 to 4. The Bt horizon has hue of 7.5YR or 10YR,

value of 4 or 5, and chroma of 4 to 6. It is loam, clay loam, or sandy loam. The 2C horizon has value of 4 or 5 and chroma of 3 to 6. It is stratified gravelly silt loam to gravel.

Onarga Series

The Onarga series consists of well drained soils on terraces. These soils formed in loamy and sandy material. Permeability is moderate or moderately rapid in the upper part of the profile and rapid in the lower part. Slopes range from 0 to 7 percent.

Typical pedon of Onarga sandy loam, 0 to 3 percent slopes, 2,082 feet south and 288 feet west of the northeast corner of sec. 6, T. 23 N., R. 6 W.

Ap—0 to 6 inches; very dark grayish brown (10YR 3/2) sandy loam, grayish brown (10YR 5/2) dry; weak medium granular structure; friable; few very fine roots; neutral; abrupt smooth boundary.

A—6 to 11 inches; very dark grayish brown (10YR 3/2) sandy loam, grayish brown (10YR 5/2) dry; weak medium platy structure parting to weak medium subangular blocky; friable; few very fine roots; neutral; clear smooth boundary.

Bt1—11 to 20 inches; dark brown (10YR 4/3) loam; moderate medium subangular blocky structure; friable; few very fine roots; common faint dark brown (10YR 3/3) clay films on faces of peds; neutral; clear smooth boundary.

Bt2—20 to 29 inches; dark brown (10YR 4/3) loam; moderate medium subangular blocky structure; friable; few very fine roots; common faint dark brown (10YR 3/3) clay films on faces of peds; neutral; gradual smooth boundary.

BC—29 to 33 inches; brown (7.5YR 4/4) loamy sand; weak medium subangular blocky structure; very friable; neutral; clear smooth boundary.

C—33 to 60 inches; brown (7.5YR 5/4) loamy sand; single grain; loose; slightly acid.

The thickness of the solum ranges from 30 to 50 inches. The thickness of the mollic epipedon ranges from 10 to 20 inches.

The A horizon has value of 2 or 3 and chroma of 1 to 3. The Bt horizon has hue of 10YR or 7.5YR and chroma of 3 or 4. It is loam or sandy loam. The C horizon has hue of 7.5YR or 10YR and value of 4 or 5. It is loam, sandy loam, loamy sand, or sand.

Orio Series

The Orio series consists of poorly drained soils on terraces. These soils formed in loamy and sandy sediments. Permeability is moderately slow in the upper part of the profile and rapid in the lower part. Slopes range from 0 to 2 percent.

Typical pedon of Orio fine sandy loam, 1,578 feet south and 132 feet west of the northeast corner of sec. 19, T. 22 N., R. 5 W.

Ap—0 to 9 inches; very dark gray (10YR 3/1) fine sandy loam, dark gray (10YR 4/1) dry; mixed with some dark grayish brown (10YR 4/2) E material; weak medium granular structure; friable; very few fine roots; strongly acid; abrupt smooth boundary.

E1—9 to 18 inches; grayish brown (10YR 5/2) loamy fine sand; weak medium platy structure; very friable; few very fine roots; slightly acid; clear smooth boundary.

E2—18 to 21 inches; grayish brown (10YR 5/2) fine sandy loam; weak medium platy structure; very friable; few very fine roots; neutral; clear smooth boundary.

Btg1—21 to 26 inches; grayish brown (10YR 5/2) loam; common fine prominent strong brown (7.5YR 5/6) mottles; weak fine subangular blocky structure; friable; few very fine roots; many faint dark grayish brown (10YR 4/2) clay films on faces of peds; slightly acid; clear smooth boundary.

Btg2—26 to 35 inches; grayish brown (2.5Y 5/2) clay loam; common fine prominent strong brown (7.5YR 5/6) and few fine faint light brownish gray (2.5Y 6/2) mottles; weak fine and medium subangular blocky structure; friable; few very fine roots; many prominent gray (10YR 5/1) clay films on faces of peds; neutral; clear smooth boundary.

Btg3—35 to 43 inches; light brownish gray (2.5Y 6/2) fine sandy loam that has thin strata of light gray (10YR 7/2) sand; few medium prominent strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable; many prominent gray (5Y 5/1) clay films on faces of peds; neutral; clear smooth boundary.

Cg1—43 to 49 inches; light olive gray (5Y 6/2), stratified fine sandy loam and sandy clay loam; many fine prominent strong brown (7.5YR 5/6) mottles; massive; friable; neutral; gradual smooth boundary.

Cg2—49 to 60 inches; light gray (5Y 6/1) loamy fine sand; few fine prominent strong brown (7.5YR 5/6) mottles; massive; friable; neutral.

The thickness of the solum ranges from 40 to 60 inches. The Ap horizon has chroma of 1 or 2. The E horizon has value of 4 or 5. The Btg horizon has hue of 10YR, 2.5Y, or 5Y. The Cg horizon has hue of 10YR, 2.5Y, or 5Y and value of 5 or 6. It is stratified sandy clay loam, fine sandy loam, loamy sand, loamy fine sand, or sand.

Palms Series

The Palms series consists of very poorly drained, moderately slowly permeable soils on terraces. These soils formed in organic material over stratified, loamy sediments. Slopes range from 0 to 2 percent.

Typical pedon of Palms muck, 701 feet south and 856 feet east of the northwest corner of sec. 30, T. 23 N., R. 5 W.

Op—0 to 12 inches; sapric material (muck), black (10YR 2/1) broken face, rubbed, and pressed; weak fine subangular structure parting to weak fine granular; very friable; few very fine roots; about 30 percent mineral material; slightly acid; clear smooth boundary.

Oa1—12 to 23 inches; sapric material (muck), very dark gray (N 2/0) broken face, rubbed, and pressed; weak fine and medium subangular structure; very friable; few very fine roots; about 50 percent mineral material; slightly acid; clear smooth boundary.

Oa2—23 to 27 inches; sapric material (muck), very dark grayish brown (10YR 3/2) broken face, rubbed, and pressed; massive; very friable; few very fine roots; about 75 percent mineral material; slightly acid; abrupt smooth boundary.

C1—27 to 39 inches; grayish brown (2.5Y 5/2), stratified silt loam and loam; massive; very friable; mildly alkaline; clear smooth boundary.

C2—39 to 60 inches; light gray (5Y 6/1), stratified loam and sandy loam; few fine prominent light olive brown (2.5Y 5/4) mottles; massive; very friable; mildly alkaline.

The thickness of the organic material ranges from 16 to 30 inches. The 2C horizon has value of 4 to 6 and chroma of 1 to 3. It is stratified silt, silt loam, loam, clay loam, sandy loam, or loamy sand.

Parr Series

The Parr series consists of well drained soils on uplands. These soils formed in glacial till. Permeability is moderate in the upper part of the profile and moderately slow in the lower part. Slopes range from 5 to 12 percent.

The Parr soils in this survey area are taxadjuncts because they have a dark surface layer that is slightly thinner than is definitive for the series. This difference, however, does not alter the use or behavior of the soils. The soils are classified as fine-loamy, mixed, mesic Mollic Hapludalfs.

Typical pedon of Parr silt loam, 5 to 12 percent slopes, eroded, 265 feet south and 640 feet east of the northwest corner of sec. 9, T. 26 N., R. 2 W.

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; common very fine roots; slightly acid; abrupt smooth boundary.

Bt1—8 to 18 inches; brown (10YR 4/3) clay loam; moderate fine subangular blocky structure; friable; common very fine roots; common distinct very dark gray (10YR 3/1) organic coatings on faces of peds; few pebbles; slightly acid; clear smooth boundary.

Bt2—18 to 26 inches; yellowish brown (10YR 5/4) clay loam; moderate medium subangular blocky structure; firm; few fine roots; few distinct dark brown (10YR 4/3) clay films on faces of peds; few pebbles; neutral; clear smooth boundary.

C1—26 to 30 inches; brown (10YR 5/3) loam; massive; firm; few very fine roots; few pebbles; slight effervescence; mildly alkaline; gradual smooth boundary.

C2—30 to 60 inches; brown (10YR 5/3) loam; massive; firm; few pebbles; strong effervescence; moderately alkaline.

The thickness of the solum ranges from 24 to 30 inches. The Ap horizon has chroma of 2 or 3. The Bt horizon is loam or clay loam. The C horizon has chroma of 3 or 4. It is loam or silt loam.

Plainfield Series

The Plainfield series consists of excessively drained, rapidly permeable soils on terraces. These soils formed in sandy windblown material. Slopes range from 3 to 45 percent.

Typical pedon of Plainfield sand, 7 to 18 percent slopes, 2,200 feet north and 306 feet west of the center of sec. 9, T. 23 N., R. 6 W.

Ap—0 to 5 inches; dark brown (10YR 3/3) sand, brown (10YR 5/3) dry; weak medium granular structure; very friable; common very fine and fine roots; common faint very dark grayish brown (10YR 3/2) organic coatings on sand grains; slightly acid; clear smooth boundary.

BA—5 to 11 inches; brown (10YR 4/3) sand; weak medium granular structure; very friable; few very fine roots; few distinct very dark grayish brown (10YR 3/2) organic coatings on sand grains; neutral; gradual smooth boundary.

Bw—11 to 24 inches; brown (10YR 4/3) sand; weak medium subangular blocky structure; very friable; few very fine roots; few distinct very dark grayish brown (10YR 3/2) organic coatings on sand grains; slightly acid; gradual smooth boundary.

BC—24 to 32 inches; brown (10YR 4/3) sand; weak medium subangular blocky structure; very friable;

few very fine roots; few distinct dark brown (10YR 3/3) organic coatings on sand grains; slightly acid; gradual smooth boundary.

C1—32 to 39 inches; dark yellowish brown (10YR 4/4) sand; single grain; loose; few very fine roots; slightly acid; gradual smooth boundary.

C2—39 to 60 inches; dark yellowish brown (10YR 4/4) sand; single grain; loose; slightly acid.

The thickness of the solum ranges from 12 to 40 inches. The Ap and Bw horizons are loamy sand or sand. The Ap horizon has value of 3 or 4 and chroma of 1 to 3. The Bw horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 to 6. The C horizon has hue of 7.5YR or 10YR and chroma of 4 to 6.

Plano Series

The Plano series consists of well drained and moderately well drained, moderately permeable soils on terraces. These soils formed in silty material over stratified sediments. Slopes range from 0 to 5 percent.

Typical pedon of Plano silt loam, 2 to 5 percent slopes, 1,480 feet west and 420 feet north of the southeast corner of sec. 31, T. 24 N., R. 2 W.

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak very fine granular structure; friable; many very fine and fine roots; neutral; abrupt smooth boundary.

AB—9 to 13 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; common very fine roots; neutral; clear smooth boundary.

Bt1—13 to 21 inches; dark yellowish brown (10YR 4/4) silty clay loam; strong fine and medium subangular blocky structure; friable; few very fine roots; many distinct very dark grayish brown (10YR 3/2) organic coatings and common faint brown (10YR 4/3) clay films on faces of peds; medium acid; clear smooth boundary.

Bt2—21 to 31 inches; yellowish brown (10YR 5/4) silty clay loam; common fine prominent grayish brown (2.5Y 5/2) mottles; strong fine prismatic structure parting to strong fine and medium subangular blocky; friable; few very fine roots; many faint brown (10YR 4/3) clay films on faces of peds; slightly acid; clear smooth boundary.

Bt3—31 to 45 inches; dark yellowish brown (10YR 4/4) silt loam; common fine prominent grayish brown (2.5Y 5/2) mottles; weak medium prismatic structure; friable; few very fine roots; few faint brown (10YR 4/3) clay films on faces of peds; slightly acid; abrupt smooth boundary.

2BC—45 to 53 inches; brown (10YR 4/3) sandy loam; weak coarse prismatic structure; friable; slightly acid; gradual smooth boundary.

2C—53 to 60 inches; light olive gray (5Y 6/2), stratified sandy loam, silt loam, and loam; many medium prominent yellowish brown (10YR 5/8) mottles; massive; friable; few medium rounded concretions of iron and manganese oxide; neutral.

The thickness of the solum ranges from 45 to more than 60 inches. The thickness of the mollic epipedon ranges from 10 to 20 inches.

The A horizon has value of 2 or 3 and chroma of 1 to 3. The Bt horizon has value of 4 or 5 and chroma of 3 to 6. It is silt loam or silty clay loam. The 2C horizon is stratified silt loam to gravelly sand.

Proctor Series

The Proctor series consists of well drained soils on terraces. These soils formed in silty material and in the underlying stratified sediments. Permeability is moderate in the upper part of the profile and moderately rapid in the lower part. Slopes range from 0 to 2 percent.

Typical pedon of Proctor silt loam, 644 feet west and 2,425 feet north of the southeast corner of sec. 35, T. 24 N., R. 5 W.

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak very fine granular structure; friable; many very fine roots; strongly acid; abrupt smooth boundary.

A—8 to 19 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine subangular blocky structure parting to moderate fine granular; friable; common very fine roots; medium acid; gradual smooth boundary.

Bt1—19 to 24 inches; brown (10YR 4/3) silty clay loam; moderate fine subangular blocky structure; friable; common very fine roots; many faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; medium acid; clear smooth boundary.

Bt2—24 to 32 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine and medium prismatic structure parting to moderate fine and medium subangular blocky; friable; common very fine roots; many faint dark brown (10YR 3/3) clay films on faces of peds; medium acid; abrupt smooth boundary.

2Bt3—32 to 38 inches; dark yellowish brown (10YR 4/4) loam; weak medium prismatic structure parting to weak medium subangular blocky; friable; common very fine roots; many faint dark brown (10YR 3/3) clay films on faces of peds; medium acid; clear smooth boundary.

2Bt4—38 to 48 inches; dark yellowish brown (10YR 4/6), stratified loam and sandy loam; weak coarse prismatic structure; very friable; common distinct brown (10YR 4/3) clay films on faces of peds; medium acid; gradual smooth boundary.

2C—48 to 60 inches; dark yellowish brown (10YR 4/6) sandy loam that has strata of yellowish brown (10YR 5/6) loamy sand and dark brown (10YR 3/3) gravelly clay loam; massive; very friable; slightly acid.

The thickness of the solum ranges from 40 to 55 inches. The thickness of the mollic epipedon ranges from 10 to 22 inches. The thickness of the loess ranges from 24 to 40 inches.

The A horizon has value of 3 or 4 and chroma of 1 to 3. The Bt and 2Bt horizons have value of 4 or 5 and chroma of 3 to 6. They are silt loam, silty clay loam, loam, or sandy loam. The 2C horizon has value of 4 or 5 and chroma of 2 to 6. It is stratified gravelly clay loam to sand.

Radford Series

The Radford series consists of somewhat poorly drained, moderately permeable soils on flood plains. These soils formed in silty alluvium over a buried soil. Slopes range from 0 to 2 percent.

Typical pedon of Radford silt loam, frequently flooded, 1,280 feet north and 870 feet east of the southwest corner of sec. 8, T. 23 N., R. 2 W.

Ap—0 to 11 inches; very dark grayish brown (10YR 3/2) silt loam, dark grayish brown (10YR 4/2) dry; weak fine subangular blocky structure parting to weak fine granular; friable; few very fine roots; few faint very dark gray (10YR 3/1) organic coatings on faces of peds; neutral; clear smooth boundary.

A—11 to 19 inches; very dark grayish brown (10YR 3/2) silt loam, dark grayish brown (10YR 4/2) dry; weak fine and medium subangular blocky structure; friable; few very fine roots; common faint very dark gray (10YR 3/1) organic coatings on faces of peds; neutral; gradual smooth boundary.

C—19 to 26 inches; very dark gray (10YR 3/1) silt loam that has strata of pale brown (10YR 6/3) silt loam; massive; friable; few very fine roots; neutral; clear smooth boundary.

Ab1—26 to 36 inches; black (10YR 2/1) silty clay loam; moderate very fine and fine granular structure; friable; few very fine roots; neutral; gradual smooth boundary.

Ab2—36 to 43 inches; very dark gray (10YR 3/2) silty clay loam; few fine faint brown (10YR 4/3) mottles; moderate fine subangular blocky structure parting to moderate fine granular; friable; few very fine roots; many faint black (10YR 3/1) organic coatings on faces of peds; neutral; gradual smooth boundary.

Bgb1—43 to 54 inches; dark grayish brown (10YR 4/2) silt loam; common fine prominent yellowish brown (10YR 5/6) mottles; weak fine and medium subangular blocky structure; friable; few faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; few fine accumulations of iron and manganese oxide; very dark gray (10YR 3/1) fillings in channels; neutral; clear smooth boundary.

Bgb2—54 to 60 inches; grayish brown (2.5Y 5/2) silty clay loam; many fine and medium prominent yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; few prominent very dark grayish brown (10YR 3/2) organic coatings on faces of peds; few fine accumulations of iron and manganese oxide; very dark grayish brown (10YR 3/2) fillings in channels; neutral.

The thickness of the solum and of the mollic epipedon ranges from 10 to 24 inches. Depth to the buried soil ranges from 24 to 40 inches.

The A horizon has chroma of 1 or 2. The C horizon has value of 2 to 6 and chroma of 1 to 3. It is loam, silty clay loam, or silt loam. The Ab horizon has hue of 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 2. It is silt loam or silty clay loam. The Bgb horizon has hue of 2.5Y or 10YR, value of 3 to 5, and chroma of 1 or 2.

Ridgeville Series

The Ridgeville series consists of somewhat poorly drained soils on terraces and outwash plains. These soils formed in loamy and sandy material. Permeability is moderate in the upper part of the profile and moderately rapid in the lower part. Slopes range from 0 to 2 percent.

Typical pedon of Ridgeville sandy loam, 165 feet north and 1,184 feet east of the southwest corner of sec. 19, T. 22 N., R. 6 W.

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) sandy loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; many very fine roots; common faint very dark gray (10YR 3/1) organic coatings on faces of peds; medium acid; clear smooth boundary.

A—9 to 18 inches; very dark grayish brown (10YR 3/2) sandy loam, grayish brown (10YR 5/2) dry; weak fine subangular blocky structure; friable; common very fine and fine roots; common faint very dark gray (10YR 3/1) organic coatings on faces of peds; medium acid; gradual smooth boundary.

Bt1—18 to 26 inches; dark grayish brown (10YR 4/2) sandy loam; common fine distinct dark yellowish brown (10YR 4/6) and few fine faint dark grayish brown (2.5Y 4/2) mottles; weak fine and medium subangular blocky structure; friable; common very fine roots; common distinct very dark grayish brown (10YR 3/2) clay films on faces of peds; medium acid; clear smooth boundary.

Bt2—26 to 36 inches; dark grayish brown (10YR 4/2) sandy loam; many fine distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; few very fine and fine roots; common distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; strongly acid; clear smooth boundary.

2Cg—36 to 60 inches; light brownish gray (10YR 6/2) sand; common fine distinct dark yellowish brown (10YR 4/6) mottles; single grain; loose; strongly acid.

The thickness of the solum ranges from 35 to 45 inches. The thickness of the mollic epipedon ranges from 10 to 24 inches.

The Ap and A horizons have value of 2 or 3 and chroma of 1 or 2. They are sandy loam, fine sandy loam, loam, or loamy sand. The Bt horizon has value of 4 or 5 and chroma of 2 to 4. It is loam, sandy clay loam, sandy loam, or fine sandy loam. The 2Cg horizon has value of 4 to 6 and chroma of 2 to 6. It is sand or loamy sand.

Rodman Series

The Rodman series consists of excessively drained soils on terraces. These soils formed in loamy material over calcareous, stratified sand and gravel. Permeability is moderately rapid in the upper part of the profile and very rapid in the lower part. Slopes range from 7 to 40 percent.

Typical pedon of Rodman gravelly loam, 18 to 40 percent slopes, 102 feet south and 752 feet west of the northeast corner of sec. 9, T. 23 N., R. 3 W.

A—0 to 8 inches; very dark grayish brown (10YR 3/2) gravelly loam, dark grayish brown (10YR 4/2) dry; weak fine granular structure; friable; common very fine roots; about 15 percent fine and medium gravel; neutral; clear smooth boundary.

Bw—8 to 14 inches; dark brown (10YR 3/3) gravelly loam; weak fine subangular blocky structure; very friable; few very fine roots; common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; about 30 percent fine and medium gravel; slight effervescence; mildly alkaline; abrupt smooth boundary.

C—14 to 60 inches; brown (10YR 4/3), stratified sand and gravel; single grain; loose; about 70 percent fine, medium, and coarse gravel; violent effervescence; moderately alkaline.

The thickness of the solum ranges from 10 to 15 inches. It is the same as the depth to free carbonates. The A horizon has chroma of 1 or 2. The Bw horizon has value of 3 or 4. It is gravelly loam or gravelly sandy loam. The C horizon has value and chroma of 3 or 4.

Ross Series

The Ross series consists of well drained soils on flood plains. These soils formed in loamy alluvium. Permeability is moderate in the upper part of the profile and moderately rapid in the lower part. Slopes range from 0 to 2 percent.

Typical pedon of Ross silt loam, frequently flooded, 232 feet north and 1,490 feet west of the southeast corner of sec. 28, T. 23 N., R. 3 W.

Ap—0 to 8 inches; very dark gray (10YR 3/1) silt loam, dark grayish brown (10YR 4/2) dry; weak fine granular structure; friable; common very fine roots; neutral; clear smooth boundary.

A—8 to 13 inches; very dark grayish brown (10YR 3/2) silt loam, dark grayish brown (10YR 4/2) dry; weak fine subangular blocky structure parting to weak fine granular; friable; common very fine and fine roots; common faint very dark gray (10YR 3/1) organic coatings on faces of peds; neutral; clear smooth boundary.

Bw1—13 to 27 inches; very dark grayish brown (10YR 3/2) loam, dark grayish brown (10YR 4/2) dry; weak fine subangular blocky structure; friable; few very fine roots; few faint very dark gray (10YR 3/1) organic coatings on faces of peds; neutral; gradual smooth boundary.

Bw2—27 to 34 inches; dark brown (10YR 3/3) loam, brown (10YR 4/3) dry; weak fine and medium subangular blocky structure; friable; few very fine and coarse roots; common distinct very dark gray (10YR 3/1) and few faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; neutral; gradual smooth boundary.

Bw3—34 to 43 inches; brown (10YR 4/3) loam; weak medium subangular blocky structure; very friable; few very fine roots; many distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; neutral; gradual smooth boundary.

C1—43 to 54 inches; brown (10YR 4/3) sandy loam; massive; very friable; few very fine and fine roots; neutral; gradual smooth boundary.

C2—54 to 60 inches; brown (10YR 4/3) sandy loam;

few fine faint grayish brown (10YR 5/2) mottles; massive; very friable; about 5 percent fine and medium gravel; neutral.

The thickness of the solum ranges from 30 to 45 inches. The A horizon has value of 2 or 3 and chroma of 1 to 3. The B horizon has chroma of 2 to 4. It is silt loam, loam, or clay loam. The C horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 2 to 4.

Rozetta Series

The Rozetta series consists of moderately well drained, moderately permeable soils on uplands. These soils formed in loess. Slopes range from 1 to 7 percent.

Typical pedon of Rozetta silt loam, 1 to 5 percent slopes, eroded, 1,125 feet north and 129 feet west of the southeast corner of sec. 4, T. 23 N., R. 4 W.

Ap—0 to 7 inches; brown (10YR 4/3) silt loam, light yellowish brown (10YR 6/4) dry; weak fine granular structure; friable; few very fine roots; medium acid; clear smooth boundary.

Bt1—7 to 18 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate very fine and fine subangular blocky structure; friable; few very fine roots; many faint brown (10YR 4/3) clay films on faces of peds; few fine accumulations of iron and manganese oxide; strongly acid; clear smooth boundary.

Bt2—18 to 26 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine and very fine subangular blocky structure; friable; few very fine roots; many faint dark yellowish brown (10YR 4/4) clay films on faces of peds; strongly acid; clear smooth boundary.

Bt3—26 to 32 inches; yellowish brown (10YR 5/4) silty clay loam; common fine distinct yellowish brown (10YR 5/6) and common medium prominent grayish brown (2.5Y 5/2) mottles; weak medium subangular blocky structure; friable; few very fine roots; common faint dark yellowish brown (10YR 4/4) clay films on faces of peds; many fine accumulations of iron and manganese oxide; medium acid; clear smooth boundary.

Bt4—32 to 44 inches; yellowish brown (10YR 5/4) silty clay loam; common fine distinct yellowish brown (10YR 5/6) and common coarse prominent grayish brown (2.5Y 5/2) mottles; weak medium prismatic structure parting to weak medium subangular blocky; friable; few very fine roots; few faint dark yellowish brown (10YR 4/4) clay films on faces of peds; many fine accumulations of iron and manganese oxide; medium acid; gradual smooth boundary.

C—44 to 60 inches; yellowish brown (10YR 5/4) silt loam; common medium distinct yellowish brown (10YR 5/6) and many fine prominent grayish brown (2.5Y 5/2) mottles; massive; friable; many fine accumulations of iron and manganese oxide; slightly acid.

The thickness of the solum ranges from 42 to 60 inches. The Ap horizon has value of 4 or 5 and chroma of 2 or 3. Some pedons have an E horizon. The Bt horizon has value of 4 or 5 and chroma of 3 to 6. The C horizon has value of 4 to 6 and chroma of 2 to 6.

Sable Series

The Sable series consists of poorly drained, moderately permeable soils on uplands. These soils formed in loess. Slopes range from 0 to 2 percent.

Typical pedon of Sable silty clay loam, 189 feet north and 2,089 feet west of the southeast corner of sec. 21, T. 23 N., R. 2 W.

Ap—0 to 8 inches; black (10YR 2/1) silty clay loam, very dark gray (10YR 3/1) dry; moderate very fine and fine granular structure; firm; few very fine roots; neutral; abrupt smooth boundary.

AB—8 to 15 inches; black (10YR 2/1) silty clay loam, very dark gray (10YR 3/1) dry; weak medium subangular blocky structure; firm; few very fine roots; neutral; clear smooth boundary.

Bg—15 to 21 inches; dark gray (10YR 4/1) silty clay loam; few fine prominent grayish brown (2.5Y 5/2) mottles; moderate medium subangular blocky structure; firm; few very fine roots; common distinct black (10YR 2/1) organic coatings on faces of peds; neutral; clear smooth boundary.

Btg1—21 to 29 inches; dark grayish brown (2.5Y 4/2) silty clay loam; few fine prominent light olive brown (2.5Y 5/6) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots; few prominent dark gray (10YR 4/1) clay films and few distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; few fine accumulations of iron and manganese oxide; neutral; clear smooth boundary.

Btg2—29 to 37 inches; grayish brown (2.5Y 5/2) silty clay loam; few fine prominent light olive brown (2.5Y 5/6) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots; few prominent dark gray (10YR 4/1) clay films on faces of peds; neutral; clear smooth boundary.

Btg3—37 to 44 inches; grayish brown (2.5Y 5/2) silty clay loam; common fine prominent strong brown (7.5YR 5/6) mottles; moderate medium prismatic structure parting to moderate medium subangular

blocky; firm; few prominent dark gray (10YR 4/1) clay films on faces of peds; neutral; clear smooth boundary.

B′g—44 to 52 inches; grayish brown (2.5Y 5/2) silt loam; many medium prominent strong brown (7.5YR 5/6) mottles; weak medium prismatic structure parting to weak medium subangular blocky; friable; mildly alkaline; clear smooth boundary.

BCg—52 to 60 inches; grayish brown (2.5Y 5/2) silt loam; common medium prominent strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable; mildly alkaline.

The thickness of the solum ranges from 45 to 60 inches. The thickness of the mollic epipedon ranges from 12 to 24 inches.

The Ap horizon has hue of 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 or 1. The Bg and Btg horizons have hue of 10YR, 2.5Y, or 5Y and value of 4 to 6. Some pedons have a C horizon.

Sawmill Series

The Sawmill series consists of poorly drained, moderately permeable soils on flood plains. These soils formed in silty alluvium. Slopes range from 0 to 2 percent.

Typical pedon of Sawmill silty clay loam, frequently flooded, 190 feet south and 1,580 feet west of the northeast corner of sec. 18, T. 26 N., R. 2 W.

Ap—0 to 8 inches; black (10YR 2/1) silty clay loam, dark brown (10YR 4/1) dry; weak fine angular blocky structure; firm; few very fine roots; neutral; clear smooth boundary.

A1—8 to 18 inches; very dark gray (10YR 3/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine angular blocky structure; firm; few very fine roots; few pebbles; neutral; gradual smooth boundary.

A2—18 to 27 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine angular blocky structure; firm; few very fine roots; mildly alkaline; gradual smooth boundary.

Bg1—27 to 33 inches; gray (5Y 5/1) silty clay loam; few fine prominent yellowish brown (10YR 5/6) mottles; moderate fine prismatic structure parting to moderate medium angular blocky; firm; few very fine roots; common prominent very dark gray (10YR 3/1) organic coatings on faces of peds; black (10YR 2/1) krotovinas; mildly alkaline; clear smooth boundary.

Bg2—33 to 43 inches; olive gray (5Y 5/2) silty clay loam; common medium prominent yellowish brown (10YR 5/8) mottles; weak fine prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots; few prominent dark gray (10YR 4/1) clay films on faces of peds; very dark gray (10YR 3/1) fillings in root channels; mildly alkaline; clear smooth boundary.

Bg3—43 to 52 inches; olive gray (5Y 5/2) silty clay loam; few medium prominent strong brown (7.5YR 5/6) mottles; weak medium prismatic structure; firm; few fine roots; few prominent very dark gray (10YR 3/1) organic coatings on faces of peds; very dark gray (10YR 3/1) fillings in root channels; mildly alkaline; clear smooth boundary.

Cg—52 to 60 inches; olive gray (5Y 5/2) silty clay loam; common medium prominent strong brown (7.5YR 5/6) mottles; massive; friable; very dark gray (10YR 3/1) fillings in root channels; mildly alkaline.

The thickness of the solum ranges from 45 to 60 inches. The thickness of the mollic epipedon ranges from 24 to 36 inches.

The Ap horizon has hue of 10YR or is neutral in hue. It has chroma of 0 or 1. The Bg horizon has hue of 10YR, 2.5Y, or 5Y and value of 4 or 5. In some pedons it has strata of clay loam or silt loam in the lower part. The Cg horizon has chroma of 1 or 2. It is silty clay loam, silt loam, or loam.

Saybrook Series

The Saybrook series consists of well drained soils on uplands. These soils formed in loess and in the underlying till. Permeability is moderate in the upper part of the profile and moderately slow in the lower part. Slopes range from 5 to 12 percent.

The Saybrook soils in this survey area have a dark surface layer that is slightly thinner than is definitive for the series. This difference, however, does not alter the use or behavior of the soils. The soils are classified as fine-silty, mixed, mesic Mollic Hapludalfs.

Typical pedon of Saybrook silt loam, 5 to 12 percent slopes, eroded, 224 feet north and 890 feet east of the southwest corner of sec. 4, T. 26 N., R. 2 W.

Ap—0 to 8 inches; mixed very dark grayish brown (10YR 3/2) and dark yellowish brown (10YR 4/3) silt loam, brown (10YR 5/3) dry; weak medium granular structure; friable; few very fine roots; neutral; abrupt smooth boundary.

BA—8 to 12 inches; brown (10YR 4/3) silt loam; weak fine and medium subangular blocky structure; friable; few very fine roots; many distinct very dark grayish brown (10YR 3/2) and many faint dark brown (10YR 3/3) organic coatings on faces of peds; neutral; clear smooth boundary.

Bt1—12 to 21 inches; yellowish brown (10YR 5/4) silt loam; moderate medium subangular blocky

structure; friable; few very fine roots; common faint dark yellowish brown (10YR 4/4) clay films and few distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; neutral; clear smooth boundary.

Bt2—21 to 28 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium subangular blocky structure; firm; few very fine roots; few faint dark yellowish brown (10YR 4/4) clay films on faces of peds; neutral; abrupt smooth boundary.

2BC—28 to 32 inches; brown (7.5YR 5/4) loam; few fine distinct strong brown (7.5YR 5/8) mottles; weak coarse subangular blocky structure; firm; few very fine roots; few fine accumulations of calcium carbonate; few pebbles; slight effervescence; mildly alkaline; clear smooth boundary.

2C—32 to 60 inches; brown (7.5YR 5/4) loam; common medium prominent strong brown (7.5YR 5/8) mottles; massive; firm; few fine accumulations of iron and manganese oxide; few fine accumulations of calcium carbonate; few pebbles; violent effervescence; moderately alkaline.

The thickness of the solum ranges from 24 to 40 inches. The Ap horizon is 6 to 10 inches thick. It has chroma of 1 to 3. It is mixed with material from the upper part of the subsoil. The Bt horizon has hue of 7.5YR or 10YR and value of 4 or 5. The 2C horizon has hue of 7.5YR or 10YR and value of 5 or 6. It is silt loam or loam.

Selma Series

The Selma series consists of poorly drained, moderately permeable soils on terraces. These soils formed in loamy sediments. Slopes range from 0 to 2 percent.

Typical pedon of Selma loam, 201 feet north and 764 feet east of the southwest corner of sec. 30, T. 22 N., R. 5 W.

Ap—0 to 9 inches; black (10YR 2/1) loam, dark gray (10YR 4/1) dry; weak very fine granular structure; friable; many very fine roots; medium acid; abrupt smooth boundary.

A—9 to 22 inches; very dark gray (10YR 3/1) loam, gray (10YR 5/1) dry; moderate very fine prismatic structure parting to moderate very fine subangular blocky; friable; common very fine roots; slightly acid; gradual smooth boundary.

Bg1—22 to 35 inches; dark gray (5Y 4/1) loam; common fine prominent dark yellowish brown (10YR 4/6) mottles; moderate fine and medium prismatic structure parting to moderate fine subangular blocky; friable; few very fine roots; neutral; clear smooth boundary.

Bg2—35 to 50 inches; gray (5Y 5/1) loam; common fine prominent yellowish brown (10YR 5/6) mottles; moderate medium and coarse prismatic structure; friable; few very fine roots; very dark gray (10YR 3/1) and dark gray (10YR 4/1) krotovinas; neutral; gradual smooth boundary.

Cg—50 to 60 inches; light olive gray (5Y 6/2) silt loam and loam; few fine prominent yellowish brown (10YR 5/6) mottles; massive; friable; very dark gray (10YR 3/1) and dark gray (10YR 4/1) krotovinas; neutral.

The thickness of the solum ranges from 40 to 55 inches. The A horizon has chroma of 1 or 2. It is silt loam, loam, silty clay loam, or clay loam. The Bg horizon has hue of 2.5Y or 5Y and chroma of 1 or 2. It is loam, clay loam, or silty clay loam. The Cg horizon has hue of 10YR, 2.5Y, or 5Y, value of 5 or 6, and chroma of 1 to 6. It is stratified silt loam to loamy sand.

Shiloh Series

The Shiloh series consists of poorly drained, moderately slowly permeable soils on uplands and terraces. These soils formed in silty and clayey sediments. Slopes range from 0 to 2 percent.

Typical pedon of Shiloh silty clay loam, 360 feet north and 216 feet west of the southeast corner of sec. 13, T. 22 N., R. 5 W.

Ap—0 to 7 inches; black (N 2/0) silty clay loam, very dark gray (10YR 3/1) dry; weak fine granular structure; firm; few very fine roots; slightly acid; abrupt smooth boundary.

A1—7 to 15 inches; black (N 2/0) silty clay loam, very dark gray (10YR 3/1) dry; weak fine subangular blocky structure; firm; few very fine roots; slightly acid; clear smooth boundary.

A2—15 to 26 inches; very dark gray (10YR 3/1) silty clay, dark gray (10YR 4/1) dry; weak medium prismatic structure parting to moderate fine subangular blocky; firm; few very fine roots; neutral; clear smooth boundary.

A3—26 to 32 inches; very dark gray (10YR 3/1) silty clay, gray (10YR 5/1) dry; moderate medium prismatic structure parting to moderate medium subangular blocky; very firm; few very fine roots; neutral; clear smooth boundary.

Bg—32 to 42 inches; dark gray (10YR 4/1) silty clay; few fine distinct yellowish brown (10YR 5/4) mottles; strong medium prismatic structure parting to strong medium angular blocky; very firm; few very fine roots; neutral; clear smooth boundary.

Btg1—42 to 50 inches; dark grayish brown (2.5Y 4/2) silty clay loam; common medium prominent yellowish brown (10YR 5/6) mottles; strong medium prismatic structure parting to moderate medium angular blocky; very firm; few very fine roots; common prominent dark gray (10YR 4/1) clay films and very dark gray (10YR 3/1) organic coatings on faces of peds; neutral; clear smooth boundary.

Btg2—50 to 56 inches; dark grayish brown (2.5Y 4/2) silty clay loam; common medium prominent yellowish brown (10YR 5/6) mottles; strong medium prismatic structure parting to strong medium angular blocky; very firm; few very fine roots; common prominent dark gray (10YR 4/1) clay films on faces of peds; neutral; clear smooth boundary.

BCg—56 to 60 inches; grayish brown (2.5Y 5/2) silty clay loam; many medium prominent light olive brown (2.5Y 5/6) mottles; moderate medium prismatic structure parting to weak medium subangular blocky; firm; dark gray (10YR 4/1) fillings in root channels; neutral.

The thickness of the solum ranges from 40 to 62 inches. The thickness of the mollic epipedon ranges from 24 to 40 inches.

The A horizon has value of 2 or 3 and chroma of 0 or 1. The Bg horizon has chroma of 1 or 2. A C horizon occurs in some pedons. It is similar to the Bg horizon.

Sparta Series

The Sparta series consists of excessively drained, rapidly permeable soils on terraces. These soils formed in sandy windblown material. Slopes range from 1 to 15 percent.

Typical pedon of Sparta loamy sand, 1 to 7 percent slopes, 2,181 feet north and 132 feet east of the center of sec. 10, T. 23 N., R. 5 W.

Ap—0 to 10 inches; very dark brown (10YR 2/2) loamy sand, grayish brown (10YR 5/2) dry; weak fine granular structure; very friable; common very fine roots; neutral; abrupt smooth boundary.

A—10 to 18 inches; very dark grayish brown (10YR 3/2) sand, grayish brown (10YR 5/2) dry; weak fine subangular blocky structure; very friable; few very fine roots; neutral; clear smooth boundary.

BA—18 to 24 inches; dark yellowish brown (10YR 3/4) sand; weak medium subangular blocky structure; very friable; common faint dark brown (10YR 3/3) organic coatings on sand grains; neutral; clear smooth boundary.

Bw—24 to 31 inches; dark yellowish brown (10YR 4/4) sand; weak medium subangular blocky structure; very friable; common distinct dark brown (10YR 3/3) organic coatings on sand grains; neutral; clear smooth boundary.

BC—31 to 37 inches; yellowish brown (10YR 5/4) sand; weak medium subangular blocky structure; very friable; neutral; gradual smooth boundary.

C—37 to 60 inches; yellowish brown (10YR 5/6) sand; single grain; loose; neutral.

The thickness of the solum ranges from 35 to 45 inches. The thickness of the mollic epipedon ranges from 10 to 24 inches.

The Ap horizon has value of 2 or 3. The Bw horizon has hue of 7.5YR or 10YR and value and chroma of 3 or 4. It is loamy sand or sand. The C horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 6.

St. Charles Series

The St. Charles series consists of well drained, moderately permeable soils on terraces. These soils formed in silty material and in the underlying stratified sediments. Slopes range from 0 to 10 percent.

Typical pedon of St. Charles silt loam, 0 to 2 percent slopes, 1,310 feet south and 146 feet east of the center of sec. 23, T. 22 N., R. 2 W.

Ap—0 to 6 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; moderate medium granular structure; friable; common very fine roots; many faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; slightly acid; abrupt smooth boundary.

E—6 to 10 inches; brown (10YR 4/3) silt loam, light brownish gray (10YR 6/2) dry; weak thick platy structure parting to weak fine subangular blocky; friable; few very fine roots; few faint very dark grayish brown (10YR 3/2) organic coatings and common distinct light gray (10YR 7/2 dry) silt coatings on faces of peds; slightly acid; clear smooth boundary.

Bt1—10 to 14 inches; brown (10YR 4/3) silty clay loam; moderate fine subangular blocky structure; firm; few faint dark yellowish brown (10YR 3/4) clay films and few distinct light gray (10YR 7/2 dry) silt coatings on faces of peds; medium acid; clear smooth boundary.

Bt2—14 to 28 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium subangular blocky structure; firm; few very fine roots; common faint dark yellowish brown (10YR 3/4) clay films and few distinct light gray (10YR 7/2 dry) silt coatings on faces of peds; slightly acid; gradual smooth boundary.

Bt3—28 to 39 inches; yellowish brown (10YR 5/4) silty

clay loam; moderate medium prismatic structure; firm; few very fine roots; few faint dark yellowish brown (10YR 3/4) clay films and few distinct light gray (10YR 7/2 dry) silt coatings on faces of peds; dark yellowish brown (10YR 3/4) fillings in root channels; slightly acid; gradual smooth boundary.

Bt4—39 to 48 inches; yellowish brown (10YR 5/4) silty clay loam; weak medium prismatic structure; firm; few very fine roots; few distinct dark brown (10YR 4/3 and 7.5YR 3/4) clay films and few distinct light gray (10YR 7/2 dry) silt coatings on faces of peds; dark brown (10YR 4/3 and 7.5YR 3/4) fillings in root channels; medium acid; gradual smooth boundary.

2Bt5—48 to 55 inches; yellowish brown (10YR 5/4) loam; weak coarse prismatic structure; friable; few distinct dark brown (7.5YR 4/4) clay films and light gray (10YR 7/2 dry) silt coatings on faces of peds; dark brown (7.5YR 4/4) fillings in root channels; medium acid; gradual smooth boundary.

2C—55 to 60 inches; yellowish brown (10YR 5/4), stratified sandy loam and loam; massive; friable; dark brown (7.5YR 4/4) fillings in root channels; medium acid.

The thickness of the solum ranges from 50 to 60 inches. The Ap horizon has value of 3 or 4 and chroma of 2 or 3. The E horizon has value of 4 or 5 and chroma of 2 or 3. The Bt horizon has hue of 7.5YR or 10YR and chroma of 3 to 6. The 2Bt horizon has value of 4 or 5 and chroma of 4 to 6. It is silt loam, loam, or clay loam. The 2C horizon has hue of 7.5YR or 10YR and value of 4 or 5. It is stratified loam, sandy loam, or loamy sand.

Strawn Series

The Strawn series consists of well drained soils on uplands. These soils formed in glacial till. Permeability is moderate in the upper part of the profile and moderately slow in the lower part. Slopes range from 15 to 20 percent.

Typical pedon of Strawn loam, 15 to 20 percent slopes, 1,944 feet north and 96 feet west of the southeast corner of sec. 17, T. 22 N., R. 2 W.

Ap—0 to 7 inches; brown (10YR 4/3 and 5/3) loam, pale brown (10YR 6/3) and very pale brown (10YR 7/3) dry; weak fine and medium granular structure; friable; common fine roots; few pebbles; neutral; abrupt smooth boundary.

Bt1—7 to 11 inches; brown (10YR 4/3) clay loam; moderate fine subangular blocky structure; firm; few fine roots; many faint brown (10YR 4/3) clay films on faces of peds; few pebbles; neutral; clear smooth boundary.

Bt2—11 to 22 inches; brown (10YR 4/3) clay loam; moderate medium subangular blocky structure; firm; few very fine roots; many faint brown (10YR 4/3) clay films on faces of peds; few pebbles; neutral; clear smooth boundary.

C—22 to 60 inches; brown (10YR 5/3) loam; few fine prominent strong brown (7.5YR 5/8) mottles; massive; firm; few pebbles; strong effervescence; moderately alkaline.

The thickness of the solum ranges from 16 to 24 inches. The A or Ap horizon has value of 3 or 4 and chroma of 2 or 3. An E horizon occurs in some pedons. It has value of 4 or 5 and chroma of 3 or 4. It is silt loam or loam. The Bt horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 or 4. It is clay loam or silty clay loam. The C horizon has hue of 7.5YR or 10YR and chroma of 3 or 4. It is loam or silt loam.

Stronghurst Series

The Stronghurst series consists of somewhat poorly drained, moderately permeable soils on uplands. These soils formed in loess. Slopes range from 0 to 2 percent.

Typical pedon of Stronghurst silt loam, 222 feet north and 1,515 feet west of the center of sec. 16, T. 22 N., R. 2 W.

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak medium granular structure; friable; few very fine roots; medium acid; abrupt smooth boundary.

E—7 to 12 inches; grayish brown (10YR 5/2) silt loam, light brownish gray (10YR 6/2) dry; weak medium prismatic structure parting to weak fine subangular blocky; friable; few very fine roots; common faint dark grayish brown (10YR 4/2) clay films on faces of peds; medium acid; abrupt smooth boundary.

Bt1—12 to 24 inches; brown (10YR 5/3) silty clay loam; common fine faint dark grayish brown (10YR 4/2) and few fine prominent strong brown (7.5YR 5/6) mottles; moderate fine and medium subangular blocky structure; firm; few very fine roots; common faint dark grayish brown (10YR 4/2) clay films on faces of peds; medium acid; clear smooth boundary.

Bt2—24 to 33 inches; brown (10YR 5/3) silty clay loam; common prominent strong brown (7.5YR 5/6) and common faint dark grayish brown (10YR 4/2) mottles; moderate medium subangular blocky structure; firm; few very fine roots; few faint dark grayish brown (10YR 4/2) clay films on faces of peds; common distinct very dark gray (10YR 3/1) organic coatings on faces of peds; few fine concretions of iron and manganese oxide; medium acid; clear smooth boundary.

Bt3—33 to 40 inches; brown (10YR 5/3) silty clay loam; common medium prominent strong brown (7.5YR 5/6) and faint dark grayish brown (10YR 4/2) mottles; moderate medium and coarse subangular blocky structure; firm; few faint dark grayish brown (10YR 4/2) clay films on faces of peds; few distinct very dark gray (10YR 3/1) organic coatings on faces of peds and fillings in root channels; few fine concretions of iron and manganese oxide; neutral; clear smooth boundary.

BC—40 to 47 inches; brown (10YR 5/3) silt loam; common medium prominent strong brown (7.5YR 5/6) and common medium faint dark grayish brown (10YR 4/2) mottles; weak coarse subangular blocky structure; friable; few distinct dark gray (10YR 4/1) clay films and very dark gray (10YR 3/1) organic coatings on faces of peds and fillings in root channels; few fine concretions of iron and manganese oxide; neutral; clear smooth boundary.

C—47 to 60 inches; mottled yellowish brown (10YR 5/8) and light brownish gray (10YR 6/2) silt loam; massive; friable; few fine accumulations of iron and manganese oxide; neutral.

The thickness of the solum ranges from 42 to more than 60 inches. The Ap horizon has value of 4 or 5. The E horizon has value of 4 to 6. The Bt horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 2 to 4. It is silt loam, silty clay loam, or silty clay. The C horizon has hue of 7.5YR, 10YR, or 2.5YR and chroma of 2 to 8.

Sylvan Series

The Sylvan series consists of well drained, moderately permeable soils on uplands. These soils formed in loess. Slopes range from 5 to 18 percent.

Typical pedon of Sylvan silt loam, 5 to 10 percent slopes, eroded, 384 feet south and 665 feet east of the northwest corner of sec. 25, T. 24 N., R. 5 W.

Ap—0 to 7 inches; brown (10YR 4/3) silt loam, light yellowish brown (10YR 6/4) dry; weak very fine granular structure; friable; common very fine roots; medium acid; abrupt smooth boundary.

Bt1—7 to 14 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine prismatic structure parting to moderate fine subangular blocky; friable; common very fine roots; many faint brown (10YR 4/3) clay films on faces of peds; slightly acid; clear smooth boundary.

Bt2—14 to 22 inches; yellowish brown (10YR 5/6) silt loam; weak medium prismatic structure parting to weak medium subangular blocky; very friable; few very fine roots; common distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; slightly acid; clear smooth boundary.

Bt3—22 to 33 inches; yellowish brown (10YR 5/6) silt loam; weak coarse prismatic structure; very friable; few very fine roots; few distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; medium acid; abrupt smooth boundary.

C—33 to 60 inches; brownish yellow (10YR 6/6) silt; very friable; few very fine roots; violent effervescence; moderately alkaline.

The thickness of the solum ranges from 22 to 35 inches. The Ap horizon has chroma of 3 or 4. The C horizon has chroma of 3 to 6. It is silt or silt loam.

Tama Series

The Tama series consists of well drained and moderately well drained, moderately permeable soils on uplands. These soils formed in loess. Slopes range from 1 to 10 percent.

Tama silt loam, 5 to 10 percent slopes, eroded, has a dark surface layer that is slightly thinner than is definitive for the series. This difference, however, does not alter the use or behavior of the soil. The soil is classified as a fine-silty, mixed, mesic Mollic Hapludalf.

Typical pedon of Tama silt loam, 1 to 5 percent slopes, 3,160 feet north and 244 feet west of the southeast corner of sec. 12, T. 22 N., R. 2 W.

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; few very fine roots; neutral; abrupt smooth boundary.

A—8 to 12 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; few very fine roots; neutral; clear smooth boundary.

Bt1—12 to 16 inches; brown (10YR 4/3) silty clay loam; weak fine subangular blocky structure; friable; few very fine roots; few distinct very dark grayish brown (10YR 3/2) and dark brown (10YR 3/3) organic coatings on faces of peds; neutral; clear smooth boundary.

Bt2—16 to 22 inches; dark yellowish brown (10YR 4/4) silty clay loam; weak medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots; few faint brown (10YR 4/3) clay films and common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; medium acid; clear smooth boundary.

Bt3—22 to 30 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots; common faint

brown (10YR 4/3) clay films and few distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; slightly acid; clear smooth boundary.

Bt4—30 to 38 inches; dark yellowish brown (10YR 4/4) silty clay loam; common medium faint brown (10YR 5/3), common fine distinct yellowish brown (10YR 5/6), and few fine distinct grayish brown (10YR 5/2) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots; common faint brown (10YR 4/3) clay films on faces of peds; medium acid; clear smooth boundary.

Bt5—38 to 44 inches; dark yellowish brown (10YR 4/4) silty clay loam; few fine distinct grayish brown (10YR 5/2) and yellowish brown (10YR 5/6) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots; few faint brown (10YR 4/3) clay films on faces of peds; slightly acid; clear smooth boundary.

BC—44 to 55 inches; yellowish brown (10YR 5/4) silt loam; common medium distinct grayish brown (10YR 5/2) and prominent yellowish brown (7.5YR 5/6) mottles; weak medium prismatic structure parting to weak medium subangular blocky; friable; common fine accumulations of iron and manganese oxide; neutral; clear smooth boundary.

C—55 to 60 inches; yellowish brown (10YR 5/4) silt loam; common medium distinct grayish brown (10YR 5/2) and strong brown (7.5YR 5/6) and few fine faint brown (10YR 5/3) mottles; massive; friable; common fine accumulations of iron and manganese oxide; neutral.

The thickness of the solum ranges from 36 to more than 60 inches. The Ap horizon has value of 2 or 3 and chroma of 1 to 3. The Bt horizon has value of 4 or 5. The C horizon has value of 5 or 6 and chroma of 3 or 4.

Tice Series

The Tice series consists of somewhat poorly drained, moderately permeable soils on flood plains. These soils formed in silty alluvium. Slopes range from 0 to 2 percent.

Typical pedon of Tice silt loam, occasionally flooded, 1,238 feet south and 265 feet east of the northwest corner of sec. 1, T. 23 N., R. 6 W.

Ap—0 to 7 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate medium granular structure; friable; few very fine roots; neutral; abrupt smooth boundary.

A—7 to 21 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; few fine prominent reddish brown (5YR 4/3) mottles; moderate medium granular structure; friable; few fine and very fine roots; neutral; clear smooth boundary.

BA—21 to 29 inches; brown (10YR 4/3) silt loam; few fine prominent reddish brown (5YR 4/3) and few medium faint dark grayish brown (10YR 4/2) mottles; moderate very fine subangular blocky structure parting to moderate medium granular; friable; few very fine roots; many distinct very dark gray (10YR 3/1) organic coatings on faces of peds; neutral; gradual smooth boundary.

Bw1—29 to 38 inches; brown (10YR 4/3) silty clay loam; common fine faint yellowish brown (10YR 5/4) and common medium faint dark grayish brown (10YR 4/2) mottles; weak medium subangular blocky structure; friable; few very fine roots; common distinct dark gray (10YR 4/1) coatings on faces of peds; neutral; gradual smooth boundary.

Bw2—38 to 50 inches; brown (10YR 4/3) silt loam; few fine distinct dark yellowish brown (10YR 4/6) and few medium faint dark grayish brown (10YR 4/2) mottles; weak medium prismatic structure parting to weak medium and coarse subangular blocky; friable; few very fine roots; few distinct dark gray (10YR 4/1) coatings on faces of peds; common fine concretions of iron and manganese oxide; neutral; gradual smooth boundary.

C—50 to 60 inches; pale brown (10YR 6/3) silt loam; few fine distinct dark grayish brown (10YR 4/2) and yellowish brown (10YR 5/6) mottles; massive; friable; few very fine roots; very slight effervescence; mildly alkaline.

The thickness of the solum ranges from 45 to more than 60 inches. The thickness of the mollic epipedon ranges from 15 to 24 inches.

The A and Bw horizons are silt loam or silty clay loam. The A horizon has value of 2 or 3 and chroma of 1 or 2. The Bw horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 to 4.

Titus Series

The Titus series consists of poorly drained, slowly permeable soils on flood plains. These soils formed in clayey and silty alluvium. Slopes range from 0 to 2 percent.

Typical pedon of Titus silty clay, rarely flooded, 890 feet east of the center of sec. 35, T. 24 N., R. 7 W.

Ap—0 to 6 inches; very dark gray (10YR 3/1) silty clay, dark gray (10YR 4/1) dry; weak fine granular structure; firm; common very fine roots; neutral; clear smooth boundary.

A—6 to 11 inches; very dark gray (10YR 3/1) silty clay,

dark gray (10YR 4/1) dry; moderate medium angular blocky structure; firm; few very fine roots; neutral; clear smooth boundary.

Bg1—11 to 19 inches; dark gray (10YR 4/1) silty clay; common fine prominent strong brown (7.5YR 4/6) mottles; weak fine prismatic structure parting to weak medium angular blocky; firm; few very fine roots; neutral; gradual smooth boundary.

Bg2—19 to 31 inches; dark gray (10YR 4/1) silty clay; common fine prominent yellowish brown (10YR 5/6) and few fine prominent strong brown (7.5YR 4/6) mottles; weak fine prismatic structure parting to moderate medium angular blocky; firm; few very fine roots; few fine accumulations of iron and manganese oxide; neutral; gradual smooth boundary.

Bg3—31 to 42 inches; gray (5Y 5/1) silty clay loam; common medium prominent yellowish brown (10YR 5/6) mottles; moderate fine prismatic structure parting to weak medium angular blocky; firm; few fine accumulations of iron and manganese oxide; neutral; gradual smooth boundary.

Bg4—42 to 54 inches; gray (5Y 5/1) silty clay; common medium prominent yellowish brown (10YR 5/6) and few fine prominent strong brown (7.5YR 4/6) mottles; moderate fine prismatic structure parting to weak fine and medium angular blocky; firm; few prominent dark gray (10YR 4/1) clay films on faces of peds; few fine accumulations of iron and manganese oxide; neutral; gradual smooth boundary.

BC—54 to 60 inches; gray (5Y 5/1) silty clay loam; common medium prominent yellowish brown (10YR 5/6) and few fine prominent strong brown (7.5YR 4/6) mottles; weak medium prismatic structure parting to weak medium angular blocky; firm; few fine accumulations of iron and manganese oxide; slight effervescence; mildly alkaline.

The thickness of the solum ranges from 50 to 60 inches. The thickness of the mollic epipedon ranges from 10 to 16 inches. The Ap and Bg horizons have chroma of 1 or 2.

Warsaw Series

The Warsaw series consists of well drained soils on terraces. These soils formed in loamy sediments over calcareous, gravelly and sandy sediments. Permeability is moderate in the upper part of the profile and very rapid in the lower part. Slopes range from 0 to 7 percent.

Typical pedon of Warsaw loam, 2 to 7 percent slopes, 634 south and 2,250 feet east of the northwest corner of sec. 20, T. 23 N., R. 5 W.

Ap—0 to 7 inches; very dark brown (10YR 2/2) loam, brown (10YR 5/3) dry; weak fine and medium granular structure; friable; few very fine roots; medium acid; clear smooth boundary.

A—7 to 17 inches; very dark brown (10YR 2/2) loam; weak medium granular structure; friable; few very fine roots; slightly acid; clear smooth boundary.

Bt1—17 to 24 inches; dark yellowish brown (10YR 4/4) loam; weak medium subangular blocky structure parting to moderate medium granular; friable; few very fine roots; common faint brown (10YR 4/3) clay films on faces of peds; common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; medium acid; clear smooth boundary.

Bt2—24 to 29 inches; dark yellowish brown (10YR 4/4) loam; weak fine and medium subangular blocky structure; friable; few very fine roots; common faint brown (10YR 4/3) clay films on faces of peds; medium acid; clear smooth boundary.

Bt3—29 to 33 inches; dark yellowish brown (10YR 4/4) loam; weak fine subangular blocky structure; very friable; few very fine roots; few faint brown (10YR 4/3) clay films on faces of peds; medium acid; clear smooth boundary.

2C—33 to 60 inches; yellowish brown (10YR 5/6), stratified gravelly loamy sand and gravelly sand; single grain; loose; few very fine roots; about 30 percent gravel; slight effervescence; mildly alkaline.

The thickness of the solum ranges from 30 to 40 inches. The thickness of the mollic epipedon ranges from 10 to 20 inches. The thickness of the loamy sediments ranges from 24 to 40 inches.

The Ap and A horizons have value of 2 or 3 and chroma of 1 or 2. The Bt horizon has hue of 7.5YR or 10YR. It is clay loam, loam, sandy clay loam, or sandy loam. The 2Bt horizon, if it occurs, is gravelly loam, gravelly sandy clay loam, or gravelly clay loam. The 2C horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 6. It is stratified loamy sand to gravelly coarse sand.

Will Series

The Will series consists of poorly drained soils on terraces. These soils formed in loamy sediments over calcareous, gravelly and sandy sediments. Permeability is moderate in the upper part of the profile and rapid in the lower part. Slopes range from 0 to 2 percent.

Typical pedon of Will loam, 2,124 feet south and 1,320 feet east of the northwest corner of sec. 19, T. 23 N., R. 5 W.

Ap—0 to 9 inches; black (10YR 2/1) loam, dark gray (10YR 4/1) dry; weak very fine granular structure;

friable; few very fine roots; neutral; abrupt smooth boundary.

A—9 to 20 inches; black (10YR 2/1) loam, dark gray (10YR 4/1) dry; weak fine subangular blocky structure; friable; few very fine roots; neutral; clear smooth boundary.

Bg—20 to 26 inches; dark gray (5Y 4/1) loam; weak medium prismatic structure; friable; few very fine roots; neutral; abrupt smooth boundary.

2Cg—26 to 60 inches; dark gray (5Y 4/1) gravelly loamy sand; few medium prominent dark yellowish brown (10YR 3/4) mottles; single grain; loose; about 20 percent gravel; strong effervescence; mildly alkaline.

The thickness of the solum ranges from 24 to 40 inches thick. The thickness of the mollic epipedon ranges from 10 to 20 inches.

The Ap and A horizons have value of 2 or 3 and chroma of 1 or 2. The Bg and 2Cg horizons have hue of 10YR, 2.5Y, or 5Y, value of 4 to 6, and chroma of 1 or 2. The Bg horizon is loam or clay loam. The 2Cg horizon is stratified gravelly loamy sand to sand.

Formation of the Soils

Soil forms through processes that act on deposited or accumulated geologic material. The characteristics of the soil at any given point are determined by the physical and mineralogical composition of the parent material; the climate under which the soil material has accumulated and has existed since accumulation; the plant and animal life on and in the soil; the relief, or lay of the land; and the length of time that the forces of soil formation have acted on the soil material.

Climate and plant and animal life are active factors of soil formation. They act on the parent material that has accumulated through weathering and through relocation by water, glaciers, or the wind. The effects of climate and plant and animal life are conditioned by relief. The type of parent material affects the kind of soil that forms and in extreme cases determines it almost entirely. Finally, time is needed for the transformation of the parent material into a soil. The length of time affects the degree of profile development and the type of soil horizons. Usually, a long time is required for the development of distinct horizons.

The soil-forming factors can vary in importance from place to place. The effects of one of the factors are modified by the effects of the others.

Parent Material

Parent material determines the limits of the chemical and mineralogical composition of the soil. The soils in Tazewell County formed in materials that were deposited by wind, water, glaciers, or meltwater from the glaciers. Some of the materials were reworked and redeposited by the subsequent actions of water and wind.

The soils in almost two-thirds of the county formed in loess, or windblown silty material. The wind picked up the silty material in the valleys of the Mississippi and Illinois Rivers and redeposited it on uplands in the county. The maximum thickness of the loess in the county is 20 or more feet. The thickness generally decreases with increasing slope.

The soils in about one-fifth of the county formed in outwash of sand, gravel, and loamy material. These soils are in the southwestern part of the county. The outwash is believed to have been reworked by wind and water into sand dunes and loamy areas underlain by sand and gravel. In a few areas a thin layer of loess covers the outwash.

The soils in about one-ninth of the county formed in alluvium, or material deposited by streams and rivers in recent time. Soil material in floodwater settles and is deposited in still or slowly moving water. The alluvial soils in the county are mainly on bottom land along the Illinois and Mackinaw Rivers. These soils are silty, clayey, or loamy, depending on the speed of the floodwater during deposition.

Glacial till consisting of compacted, calcareous, loamy material containing rock fragments of various sizes underlies most of the county. It is close enough to the surface to be the parent material in only a few scattered areas. These are sloping areas where the deposits of loess are thin. The till is believed to have been directly deposited by glaciers.

Plant and Animal Life

Living organisms affect soil formation mainly through the effects of plants on the soils. The native vegetation in Tazewell County was dominantly deciduous hardwoods and prairie grasses. Soils that formed under forest vegetation have a thin, relatively light colored surface layer that has a low content of organic matter. Soils that formed under prairie grasses have a thick, dark surface layer that has a higher content of organic matter. Plant roots provide channels for the downward movement of water through the soil and add organic matter as they decay. Plants extract nutrients, alter the pH, increase the extent of weathering, and affect the physical structure of the soils.

Micro-organisms, fungi, snails, earthworms, insects, crawfish, and burrowing animals help to decompose organic matter and mix and chemically alter the soils.

Human activities also can alter the soils. The effects of agricultural crops on soil formation differ from the effects of the native vegetation. Prairie soils no longer receive large annual additions of organic matter from the prairie grasses. Tilling the soil increases the runoff rate and the hazard of erosion. Chemical additions

affect soil pH, fertility, and the numbers and kinds of organisms inhabiting the soils. Levees and drainage tile alter natural drainage and create a drier soil climate.

Climate

Climate is an important factor of soil formation. It restricts the kind of plant and animal life on and in the soils. It determines the amount of water available for the weathering of minerals and for the translocation of soil material. Temperatures help to determine the rate of chemical processes in the soils.

Relief

Relief has markedly influenced the soils in Tazewell County through its effects on natural drainage, erosion, plant cover, and soil temperature. Slopes in the county range from 0 to 60 percent. Natural soil drainage ranges from excessively drained on sandy dunes to very poorly drained in depressions.

Relief influences soil formation by affecting runoff and drainage. Drainage, in turn, affects aeration of the soil and determines the color of the soil. The runoff rate is highest on the steepest slopes. In many low areas water is temporarily ponded. Water and air move freely through excessively drained to well drained soils and slowly through poorly and very poorly drained soils. In Jasper and other well drained, well aerated soils, the iron and aluminum compounds that give most soils their color are yellowish brown and oxidized. Sable and other poorly drained, poorly aerated soils are dull gray and mottled.

Slope affects the degree of profile development. Nearly level soils commonly are more strongly developed than the more sloping soils because the slope affects the amount of water that penetrates the surface.

Time

Time affects the degree of profile development in the soils. Deposition of material and topography can modify the effects of time. Soils that formed in redeposited material, such as alluvium on flood plains, have weakly expressed horizons and appear to be young. The degree of profile development tends to decrease as slope increases. As a result, the steeper soils appear to be younger than the less sloping soils.

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Glossary

ABC soil. A soil having an A, a B, and a C horizon.

AC soil. A soil having only an A and a C horizon. Commonly, such soil formed in recent alluvium or on steep, rocky slopes.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Association, soil. A group of soils geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bench terrace. A raised, level or nearly level strip of earth constructed on or nearly on the contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.

Blowout. A shallow depression from which all or most of the soil material has been removed by the wind. A blowout has a flat or irregular floor formed by a resistant layer or by an accumulation of pebbles or cobbles. In some blowouts the water table is exposed.

Bottom land. The normal flood plain of a stream, subject to flooding.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Catena. A sequence, or "chain," of soils on a landscape that formed in similar kinds of parent material but have different characteristics as a result of differences in relief and drainage.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural

class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Coarse fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles (flagstone) 15 to 38 centimeters (6 to 15 inches) long.

Coarse textured soil. Sand or loamy sand.

Colluvium. Soil material, rock fragments, or both moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex, soil. A map unit of two or more kinds of soil in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils are somewhat similar in all areas.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are:

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Dense layer (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a

short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum or periodically receive high rainfall, or both.

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

Drainage, surface. Runoff, or surface flow of water, from an area.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Epipedon. A diagonostic surface horizon, including the upper part of the soil that is darkened by organic matter or the upper eluvial horizons, or both.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, for example, fire, that exposes the surface.

Excess fines (in tables). Excess silt and clay in the soil. The soil is not a source of gravel or sand for construction purposes.

Fast intake (in tables). The rapid movement of water into the soil.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity.*

Fine textured soil. Sandy clay, silty clay, or clay.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Foot slope. The inclined surface at the base of a hill.

Frost action (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Glacial drift (geology). Pulverized and other rock material transported by glacial ice and then deposited. Also, the sorted and unsorted material deposited by streams flowing from glaciers.

Glacial outwash (geology). Gravel, sand, and silt, commonly stratified, deposited by glacial meltwater.

Glacial till (geology). Unsorted, nonstratified glacial drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other

elements in the profile and in gray colors and mottles.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, up to 3 inches (7.6 centimeters) in diameter.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water (geology). Water filling all the unblocked pores of the material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric and the more decomposed sapric material.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. The major horizons are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, any plowed or disturbed surface layer.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an O, A, or E horizon. The B horizon is in part a layer of transition from the overlying horizon to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) granular, prismatic, or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying horizon. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Hard, consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon but can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a

constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are:
Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.
Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.
Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.
Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.
Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.
Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.
Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.
Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.
Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Kame (geology). An irregular, short ridge or hill of stratified glacial drift.

Lacustrine deposit (geology). Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Lamellae. In subhorizons of sandy soils, thin, horizontal layers characterized by an increased content of clay.

Leaching. The removal of soluble material from soil or other material by percolating water.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by the wind.

Low strength. The soil is not strong enough to support loads.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.

Mollic epipedon. A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

Moraine (geology). An accumulation of earth, stones, and other debris deposited by a glacier. Some types are terminal, lateral, medial, and ground.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent.* The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Muck. Dark colored, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon,

hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

Outwash plain. A landform of mainly sandy or coarse textured material of glaciofluvial origin. An outwash plain is commonly smooth; where pitted, it is generally low in relief.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil, adversely affecting the specified use.

Permeability. The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Extremely acid	below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Relief. The elevations or inequalities of a land surface, considered collectively.

Rill. A steep-sided channel resulting from accelerated erosion. A rill is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Slow intake (in tables). The slow movement of water into the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.

Stripcropping. Growing crops in a systematic arrangement of strips or bands which provide vegetative barriers to soil blowing and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grain* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from soil blowing and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Substratum. The part of the soil below the solum.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from about 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Surface soil. The A, E, AB, and EB horizons. It includes all subdivisions of these horizons.

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff

so that water soaks into the soil or flows slowly to a prepared outlet.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). A layer of otherwise suitable soil material that is too thin for the specified use.

Till plain. An extensive area of nearly level to undulating soils underlain by glacial till.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toe slope. The outermost inclined surface at the base of a hill; part of a foot slope.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

(Recorded in the period 1961-90 at Peoria, Illinois)

Month	Temperature: Average daily maximum	Temperature: Average daily minimum	Temperature: Average daily	Temperature: 2 years in 10 will have-- Maximum temperature higher than--	Temperature: 2 years in 10 will have-- Minimum temperature lower than--	Temperature: Average number of growing degree days*	Precipitation: Average	Precipitation: 2 years in 10 will have-- Less than--	Precipitation: 2 years in 10 will have-- More than--	Precipitation: Average number of days with 0.10 inch or more	Precipitation: Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January-----	29.9	13.2	21.6	59	-17	7	1.51	0.58	2.28	3	7.3
February----	34.9	17.7	26.3	63	-11	15	1.42	.78	1.99	3	5.9
March-------	48.1	29.5	38.8	80	5	118	2.91	1.56	4.09	6	3.4
April-------	62.0	40.4	51.2	86	21	352	3.77	1.98	5.34	6	1.2
May---------	72.8	50.5	61.7	91	32	671	3.70	2.12	5.11	7	.0
June--------	82.2	59.9	71.1	96	44	932	3.99	1.84	5.85	5	.0
July--------	85.7	64.6	75.1	99	50	1,089	4.20	2.31	5.87	6	.0
August------	83.1	62.4	72.7	97	47	1,015	3.10	1.48	4.49	5	.0
September---	76.4	54.5	65.5	93	35	764	3.87	1.35	5.95	6	.0
October-----	64.3	42.5	53.4	85	23	423	2.65	1.04	4.01	5	.1
November----	49.3	31.9	40.6	75	9	129	2.69	1.29	3.90	5	1.9
December----	34.6	19.3	27.0	64	-12	22	2.45	1.24	3.50	5	6.4
Yearly:											
Average---	60.3	40.5	50.4	---	---	---	---	---	---	---	---
Extreme---	105	-25	---	99	-19	---	---	---	---	---	---
Total-----	---	---	---	---	---	5,536	36.26	29.11	43.01	62	26.2

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (40 degrees F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

(Recorded in the period 1961-90 at Peoria, Illinois)

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	Apr. 12	Apr. 21	May 5
2 years in 10 later than--	Apr. 7	Apr. 16	Apr. 30
5 years in 10 later than--	Mar. 30	Apr. 7	Apr. 21
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 25	Oct. 11	Oct. 1
2 years in 10 earlier than--	Oct. 30	Oct. 16	Oct. 6
5 years in 10 earlier than--	Nov. 8	Oct. 26	Oct. 16

TABLE 3.--GROWING SEASON

(Recorded in the period 1961-90 at Peoria, Illinois)

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
9 years in 10	205	181	158
8 years in 10	210	188	165
5 years in 10	221	201	177
2 years in 10	232	214	189
1 year in 10	238	221	195

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
19C2	Sylvan silt loam, 5 to 10 percent slopes, eroded	530	0.1
19D2	Sylvan silt loam, 10 to 18 percent slopes, eroded	1,650	0.4
27C2	Miami silt loam, 5 to 10 percent slopes, eroded	1,200	0.3
27D2	Miami silt loam, 10 to 15 percent slopes, eroded	3,680	0.9
36B	Tama silt loam, 1 to 5 percent slopes	43,780	10.4
36C2	Tama silt loam, 5 to 10 percent slopes, eroded	4,240	1.0
43	Ipava silt loam	55,460	13.3
45	Denny silt loam	370	0.1
54B	Plainfield sand, 3 to 7 percent slopes	3,680	0.9
54D	Plainfield sand, 7 to 18 percent slopes	4,480	1.1
54F	Plainfield loamy sand, 18 to 45 percent slopes	720	0.2
61	Atterberry silt loam	3,220	0.8
67	Harpster silty clay loam	4,140	1.0
68	Sable silty clay loam	45,330	10.8
88B	Sparta loamy sand, 1 to 7 percent slopes	3,430	0.8
88D	Sparta loamy sand, 7 to 15 percent slopes	1,360	0.3
93D	Rodman gravelly loam, 7 to 18 percent slopes	170	*
93F	Rodman gravelly loam, 18 to 40 percent slopes	570	0.1
100	Palms muck	390	0.1
102	La Hogue loam	1,880	0.4
103	Houghton muck	400	0.1
125	Selma loam	5,370	1.3
131A	Alvin loamy sand, 0 to 3 percent slopes	360	0.1
131B	Alvin loamy sand, 3 to 7 percent slopes	470	0.1
131D	Alvin fine sandy loam, 7 to 12 percent slopes	710	0.2
134A	Camden silt loam, 0 to 2 percent slopes	490	0.1
134B	Camden silt loam, 2 to 5 percent slopes	1,310	0.3
138	Shiloh silty clay loam	1,400	0.3
145C2	Saybrook silt loam, 5 to 12 percent slopes, eroded	2,030	0.5
148	Proctor silt loam	580	0.1
150A	Onarga sandy loam, 0 to 3 percent slopes	8,150	1.9
150B	Onarga sandy loam, 3 to 7 percent slopes	5,210	1.2
151	Ridgeville sandy loam	20	*
152	Drummer silty clay loam	20	*
171C2	Catlin silt loam, 4 to 10 percent slopes, eroded	6,050	1.4
198	Elburn silt loam	2,830	0.7
199A	Plano silt loam, 0 to 2 percent slopes	9,450	2.2
199B	Plano silt loam, 2 to 5 percent slopes	2,150	0.5
200	Orio fine sandy loam	2,500	0.6
201	Gilford sandy loam	20	*
221C2	Parr silt loam, 5 to 12 percent slopes, eroded	340	0.1
224E	Strawn loam, 15 to 20 percent slopes	2,720	0.6
233C2	Birkbeck silt loam, 5 to 10 percent slopes, eroded	11,020	2.6
233C3	Birkbeck silty clay loam, 5 to 10 percent slopes, severely eroded	1,490	0.4
233D2	Birkbeck silt loam, 10 to 15 percent slopes, eroded	1,140	0.3
243A	St. Charles silt loam, 0 to 2 percent slopes	1,290	0.3
243B	St. Charles silt loam, 2 to 5 percent slopes	980	0.2
243C2	St. Charles silt loam, 5 to 10 percent slopes, eroded	1,010	0.2
266A	Disco sandy loam, 0 to 3 percent slopes	1,790	0.4
272	Edgington silt loam	840	0.2
278	Stronghurst silt loam	12,560	3.0
279B2	Rozetta silt loam, 1 to 5 percent slopes, eroded	25,360	6.0
280C2	Fayette silt loam, 5 to 10 percent slopes, eroded	4,930	1.2
290A	Warsaw loam, 0 to 2 percent slopes	1,700	0.4
290B	Warsaw loam, 2 to 7 percent slopes	290	0.1
323C3	Casco clay loam, 5 to 12 percent slopes, severely eroded	590	0.1
329	Will loam	680	0.2
347	Canisteo loam	800	0.2
379A	Dakota loam, 0 to 2 percent slopes	5,260	1.3
379B	Dakota loam, 2 to 5 percent slopes	2,120	0.5
386B	Downs silt loam, 1 to 5 percent slopes	3,900	0.9
387A	Ockley sandy loam, 0 to 2 percent slopes	790	0.2

See footnote at end of table.

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

Map symbol	Soil name	Acres	Percent
439	Jasper loam, sandy substratum	8,230	2.0
447	Canisteo loam, sandy substratum	20	*
533	Urban land	3,010	0.7
684B	Broadwell silt loam, 1 to 5 percent slopes	640	0.2
684C2	Broadwell silt loam, 5 to 10 percent slopes, eroded	180	*
689B	Coloma sand, 3 to 7 percent slopes	1,270	0.3
802	Orthents, loamy	5,590	1.3
865	Pits, gravel	860	0.2
935F	Miami-Hennepin complex, 20 to 35 percent slopes	7,980	1.9
935G	Miami-Hennepin complex, 30 to 60 percent slopes	13,030	3.1
2043	Ipava-Urban land complex	1,820	0.4
2068	Sable-Urban land complex	520	0.1
2088B	Sparta-Urban land complex, 1 to 7 percent slopes	560	0.1
2266B	Disco-Urban land complex, 1 to 5 percent slopes	1,500	0.4
2278	Stronghurst-Urban land complex	1,270	0.3
2279B	Rozetta-Urban land complex, 1 to 7 percent slopes	2,990	0.7
3028	Jules silt loam, frequently flooded	1,650	0.4
3073	Ross silt loam, frequently flooded	7,920	1.9
3074	Radford silt loam, frequently flooded	3,750	0.9
3077	Huntsville silt loam, frequently flooded	5,930	1.4
3107	Sawmill silty clay loam, frequently flooded	8,090	1.9
3304	Landes fine sandy loam, frequently flooded	3,610	0.9
3451	Lawson silt loam, frequently flooded	3,560	0.8
7070	Beaucoup silty clay loam, rarely flooded	1,740	0.4
7302	Ambraw loam, rarely flooded	5,350	1.3
7404	Titus silty clay, rarely flooded	7,200	1.7
8028	Jules silt loam, occasionally flooded	570	0.1
8284	Tice silt loam, occasionally flooded	1,720	0.4
	Water	8,950	2.1
	Total	420,910	100.0

* Less than 0.05 percent. The combined extent of the soils assigned an asterisk in the "Percent" column is about 0.1 percent of the survey area.

TABLE 5.--PRIME FARMLAND

(Only the soils considered prime farmland are listed. Urban or built-up areas of the soils listed are not considered prime farmland. If a soil is prime farmland only under certain conditions, the conditions are specified in parentheses after the soil name)

Map symbol	Soil name
36B	Tama silt loam, 1 to 5 percent slopes
43	Ipava silt loam
45	Denny silt loam (where drained)
61	Atterberry silt loam (where drained)
67	Harpster silty clay loam (where drained)
68	Sable silty clay loam (where drained)
102	La Hogue loam
125	Selma loam (where drained)
131A	Alvin loamy sand, 0 to 3 percent slopes
131B	Alvin loamy sand, 3 to 7 percent slopes
134A	Camden silt loam, 0 to 2 percent slopes
134B	Camden silt loam, 2 to 5 percent slopes
138	Shiloh silty clay loam (where drained)
148	Proctor silt loam
150A	Onarga sandy loam, 0 to 3 percent slopes
150B	Onarga sandy loam, 3 to 7 percent slopes
151	Ridgeville sandy loam
152	Drummer silty clay loam (where drained)
198	Elburn silt loam
199A	Plano silt loam, 0 to 2 percent slopes
199B	Plano silt loam, 2 to 5 percent slopes
200	Orio fine sandy loam (where drained)
201	Gilford sandy loam (where drained)
243A	St. Charles silt loam, 0 to 2 percent slopes
243B	St. Charles silt loam, 2 to 5 percent slopes
266A	Disco sandy loam, 0 to 3 percent slopes
272	Edgington silt loam (where drained)
278	Stronghurst silt loam (where drained)
279B2	Rozetta silt loam, 1 to 5 percent slopes, eroded
290A	Warsaw loam, 0 to 2 percent slopes
290B	Warsaw loam, 2 to 7 percent slopes
329	Will loam (where drained)
347	Canisteo loam (where drained)
379A	Dakota loam, 0 to 2 percent slopes
379B	Dakota loam, 2 to 5 percent slopes
386B	Downs silt loam, 1 to 5 percent slopes
387A	Ockley sandy loam, 0 to 2 percent slopes
439	Jasper loam, sandy substratum
447	Canisteo loam, sandy substratum (where drained)
684B	Broadwell silt loam, 1 to 5 percent slopes
3028	Jules silt loam, frequently flooded (where protected from flooding or not frequently flooded during the growing season)
3073	Ross silt loam, frequently flooded (where protected from flooding or not frequently flooded during the growing season)
3074	Radford silt loam, frequently flooded (where protected from flooding or not frequently flooded during the growing season)
3077	Huntsville silt loam, frequently flooded (where protected from flooding or not frequently flooded during the growing season)
3107	Sawmill silty clay loam, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
3304	Landes fine sandy loam, frequently flooded (where protected from flooding or not frequently flooded during the growing season)
3451	Lawson silt loam, frequently flooded (where protected from flooding or not frequently flooded during the growing season)
7070	Beaucoup silty clay loam, rarely flooded (where drained)
7302	Ambraw loam, rarely flooded (where drained)
7404	Titus silty clay, rarely flooded (where drained)
8028	Jules silt loam, occasionally flooded
8284	Tice silt loam, occasionally flooded

TABLE 6.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE

(Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)

Soil name and map symbol	Land capability	Corn	Soybeans	Winter wheat	Oats	Orchardgrass-alfalfa hay	Bromegrass-alfalfa
		Bu	Bu	Bu	Bu	Tons	AUM*
19C2------------ Sylvan	IIIe	105	33	50	62	4.7	7.8
19D2------------ Sylvan	IIIe	101	32	48	59	4.5	7.5
27C2------------ Miami	IIIe	114	38	48	64	4.5	7.5
27D2------------ Miami	IVe	109	25	32	61	4.3	7.2
36B------------- Tama	IIe	153	46	61	88	5.8	9.7
36C2------------ Tama	IIIe	146	43	58	84	5.5	11.1
43-------------- Ipava	I	163	52	66	91	---	---
45-------------- Denny	IIIw	113	37	47	62	---	---
54B------------- Plainfield	IVs	---	---	---	35	---	3.7
54D------------- Plainfield	VIs	---	---	---	---	---	3.4
54F------------- Plainfield	VIIs	---	---	---	---	---	---
61-------------- Atterberry	I	149	44	60	85	5.6	9.3
67-------------- Harpster	IIw	136	44	52	74	---	---
68-------------- Sable	IIw	156	51	61	85	---	---
88B------------- Sparta	IVs	84	29	37	53	3.3	5.5
88D------------- Sparta	VIs	---	---	---	42	3.0	5.0
93D------------- Rodman	IVs	---	---	---	---	---	---
93F------------- Rodman	VIIs	---	---	---	---	---	---
100------------- Palms	IIIw	115	36	---	65	---	---

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Soybeans	Winter wheat	Oats	Orchardgrass-alfalfa hay	Bromegrass-alfalfa
		Bu	Bu	Bu	Bu	Tons	AUM*
102 La Hogue	I	129	43	56	80	5.2	8.6
103 Houghton	IIIw	129	44	---	---	---	---
125 Selma	IIw	136	44	53	76	---	---
131A Alvin	IIs	99	37	47	67	4.1	6.8
131B Alvin	IIIe	98	37	47	66	4.0	6.7
131D Alvin	IIIe	95	36	45	63	4.0	6.5
134A Camden	I	125	39	55	72	5.0	8.3
134B Camden	IIe	124	39	54	71	5.0	8.2
138 Shiloh	IIw	139	46	56	70	---	---
145C2 Saybrook	IIIe	131	43	56	79	5.3	8.7
148 Proctor	I	144	44	59	88	5.5	9.2
150A Onarga	IIs	110	36	48	74	4.2	7.0
150B Onarga	IIe	107	35	46	72	4.2	6.8
151 Ridgeville	IIs	115	40	53	75	4.6	7.7
152 Drummer	IIw	154	51	61	83	---	---
171C2 Catlin	IIIe	141	43	57	82	5.5	9.1
198 Elburn	I	161	50	63	94	6.1	10.2
199A Plano	I	151	45	60	90	5.8	9.7
199B Plano	IIe	150	45	59	89	5.7	9.6
200 Orio	IIw	112	37	47	64	---	6.8

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Soybeans	Winter wheat	Oats	Orchardgrass-alfalfa hay	Bromegrass-alfalfa
		Bu	Bu	Bu	Bu	Tons	AUM*
201------------- Gilford	IIw	110	39	46	68	---	---
221C2----------- Parr	IIIe	121	41	53	73	4.9	8.3
224E------------ Strawn	IVe	95	---	37	51	3.5	5.8
233C2----------- Birkbeck	IIIe	116	38	52	66	4.7	7.8
233C3----------- Birkbeck	IVe	107	36	48	61	4.4	7.2
233D2----------- Birkbeck	IIIe	111	37	50	63	4.5	7.5
243A------------ St. Charles	I	127	40	56	73	5.1	8.2
243B------------ St. Charles	IIe	126	39	55	72	5.0	8.1
243C2----------- St. Charles	IIIe	119	---	53	69	4.8	7.7
266A------------ Disco	IIIs	103	35	44	65	4.0	6.7
272------------- Edgington	IIw	122	42	51	68	---	---
278------------- Stronghurst	IIw	138	42	55	76	5.3	9.3
279B2----------- Rozetta	IIe	129	40	53	72	5.1	8.5
280C2----------- Fayette	IIIe	121	37	50	69	4.9	8.1
290A------------ Warsaw	IIs	115	40	53	74	4.6	7.7
290B------------ Warsaw	IIe	114	39	52	73	4.5	7.5
323C3----------- Casco	IVe	70	21	---	45	2.7	4.4
329------------- Will	IIw	117	43	53	73	---	---
347------------- Canisteo	IIw	110	36	---	77	---	---
379A------------ Dakota	IIs	105	35	---	65	4.5	7.5

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Soybeans	Winter wheat	Oats	Orchardgrass-alfalfa hay	Bromegrass-alfalfa
		Bu	Bu	Bu	Bu	Tons	AUM*
379B------------ Dakota	IIe	105	35	---	65	4.5	7.5
386B------------ Downs	IIe	147	43	58	82	5.6	9.2
387A------------ Ockley	I	126	42	51	75	5.0	8.3
439------------- Jasper	I	125	44	50	73	4.1	7.8
447------------- Canisteo	IIw	132	44	53	77	---	---
533**. Urban land							
684B------------ Broadwell	IIe	144	44	58	83	---	9.2
684C2----------- Broadwell	IIIe	136	41	55	79	---	8.7
689B------------ Coloma	IVs	45	18	---	45	---	---
802**. Orthents							
865**. Pits							
935F**---------- Miami-Hennepin	VIe	---	---	---	---	---	---
935G**---------- Miami-Hennepin	VIIe	---	---	---	---	---	---
2043**. Ipava-Urban land							
2068**. Sable-Urban land							
2088B**. Sparta-Urban land							
2266B**. Disco-Urban land							
2278**. Stronghurst-Urban land							

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Soybeans	Winter wheat	Oats	Orchardgrass-alfalfa hay	Bromegrass-alfalfa
		Bu	Bu	Bu	Bu	Tons	AUM*
2279B**. Rozetta-Urban land							
3028------------ Jules	IIw	83	27	---	47	3.3	5.6
3073------------ Ross	IIw	120	40	35	---	---	---
3074------------ Radford	IIIw	100	32	---	59	3.9	6.5
3077------------ Huntsville	IIw	106	34	45	60	4.1	6.8
3107------------ Sawmill	IIIw	132	42	---	---	---	---
3304------------ Landes	IIIw	67	23	---	41	2.5	4.1
3451------------ Lawson	IIIw	120	39	---	72	5.0	4.2
7070------------ Beaucoup	IIw	138	46	55	75	---	---
7302------------ Ambraw	IIw	132	43	52	70	---	---
7404------------ Titus	IIIw	125	42	52	68	---	---
8028------------ Jules	IIw	97	31	---	55	3.9	6.5
8284------------ Tice	IIw	130	40	---	---	4.8	8.1

* Animal unit month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY

(Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available)

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Productivity class*	Trees to plant
19C2, 19D2 Sylvan	6A	Slight	Slight	Slight	Slight	Yellow-poplar	90	6	White oak, black walnut, northern red oak, green ash, eastern white pine, red pine, sugar maple.
						White oak	80	4	
						Northern red oak	80	4	
						Black walnut	---	---	
27C2, 27D2 Miami	5A	Slight	Slight	Slight	Slight	White oak	90	5	Yellow-poplar, eastern white pine, red pine, white ash, black walnut.
						Yellow-poplar	98	7	
						Sweetgum	76	5	
54B Plainfield	4S	Slight	Moderate	Moderate	Slight	Black oak	70	4	Red pine, eastern white pine, jack pine.
						White oak	55	3	
						Black cherry	---	---	
						Northern red oak	---	---	
54D Plainfield	4R	Moderate	Moderate	Moderate	Slight	Black oak	70	4	Red pine, eastern white pine, jack pine.
						White oak	55	3	
						Black cherry	---	---	
						Northern red oak	---	---	
54F Plainfield	4R	Moderate	Moderate	Moderate	Slight	Black oak	70	4	Red pine, eastern white pine, jack pine.
						White oak	55	3	
						Black cherry	---	---	
						Northern red oak	---	---	
61 Atterberry	4A	Slight	Slight	Slight	Slight	White oak	70	4	Eastern white pine, red pine, Scotch pine, eastern redcedar.
						Northern red oak	70	4	
						Green ash	---	---	
						Bur oak	---	---	
88B, 88D Sparta	4S	Slight	Slight	Severe	Slight	Northern red oak	70	4	Red pine, eastern white pine, jack pine.
						Eastern white pine	---	---	
						Red pine	---	---	
						Jack pine	---	---	
93D Rodman	4S	Slight	Slight	Severe	Slight	Northern red oak	70	4	Eastern white pine, red pine, jack pine.
						White oak	70	4	
						Red pine	75	10	
						Eastern white pine	85	14	
93F Rodman	4R	Moderate	Moderate	Severe	Slight	Northern red oak	70	4	Eastern white pine, red pine, jack pine.
						White oak	70	4	
						Red pine	75	10	
						Eastern white pine	85	14	
100 Palms	2W	Slight	Severe	Severe	Severe	White ash	51	2	
						Red maple	51	2	
						Quaking aspen	56	4	
						Black willow	---	---	
						Silver maple	76	2	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
103 Houghton	2W	Slight	Severe	Severe	Severe	White ash	51	2	---
						Red maple	51	2	
						Black willow	---	---	
						Quaking aspen	56	4	
						Silver maple	76	2	
131A, 131B, 131D Alvin	4A	Slight	Slight	Slight	Slight	White oak	80	4	Green ash, black walnut, yellow-poplar, white oak, eastern white pine, American sycamore, sugar maple.
						Northern red oak	80	4	
						Black walnut	---	---	
						Yellow-poplar	90	6	
134A, 134B Camden	7A	Slight	Slight	Slight	Slight	Yellow-poplar	95	7	Yellow-poplar, white oak, green ash, black walnut, eastern white pine, red pine, black locust, white ash.
						White oak	85	5	
						Northern red oak	85	5	
						Sweetgum	80	6	
						Green ash	76	5	
201 Gilford	4W	Slight	Severe	Severe	Severe	Pin oak	70	4	Eastern white pine, European larch, white spruce, white ash.
						Eastern white pine	55	7	
						Bigtooth aspen	70	6	
						Red maple	60	3	
224E Strawn	4R	Moderate	Moderate	Moderate	Slight	White oak	80	4	White oak, black walnut, northern red oak, green ash, eastern white pine, red pine, sugar maple.
						Northern red oak	80	4	
						Yellow-poplar	90	6	
						Black walnut	---	---	
233C2, 233C3, 233D2 Birkbeck	5A	Slight	Slight	Slight	Slight	White oak	86	5	White oak, northern red oak, green ash, black walnut, eastern white pine, red pine, Scotch pine.
						Northern red oak	---	---	
						Green ash	---	---	
243A, 243B, 243C2 St. Charles	7A	Slight	Slight	Slight	Slight	Yellow-poplar	95	7	White oak, black walnut, sugar maple, eastern white pine, red pine.
						White oak	85	5	
						Northern red oak	85	5	
						Sweetgum	---	---	
						Green ash	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Productivity class*	Trees to plant
278------------- Stronghurst	4A	Slight	Slight	Slight	Slight	White oak-----------	70	4	Eastern white pine, red pine, Scotch pine, eastern redcedar.
						Northern red oak----	70	4	
						Green ash-----------	---	---	
						Bur oak-------------	---	---	
279B2----------- Rozetta	4A	Slight	Slight	Slight	Slight	White oak-----------	80	4	Eastern white pine, northern red oak, green ash, Scotch pine, yellow-poplar.
						Northern red oak----	80	4	
						Yellow-poplar-------	90	6	
						Black walnut--------	---	---	
280C2----------- Fayette	4A	Slight	Slight	Slight	Slight	White oak-----------	80	4	Northern red oak, yellow-poplar, eastern white pine, green ash.
						Northern red oak----	80	4	
						Yellow-poplar-------	90	6	
						Black walnut--------	---	---	
323C3----------- Casco	4S	Slight	Slight	Moderate	Slight	White oak-----------	70	4	Red pine.
						Red pine------------	78	10	
						Eastern white pine--	85	14	
						Jack pine-----------	68	7	
386B------------ Downs	4A	Slight	Slight	Slight	Slight	White oak-----------	80	4	Northern red oak, yellow-poplar, eastern white pine, green ash.
						Northern red oak----	80	4	
						Yellow-poplar-------	90	6	
						Black walnut--------	---	---	
387A------------ Ockley	5A	Slight	Slight	Slight	Slight	White oak-----------	90	5	Yellow-poplar, eastern white pine, red pine, white ash, black walnut.
						Northern red oak----	90	5	
						Yellow-poplar-------	98	7	
						Sweetgum------------	76	5	
689B------------ Coloma	4S	Slight	Moderate	Moderate	Slight	Northern red oak----	70	4	Eastern white pine, red pine, jack pine.
						White oak-----------	70	4	
935F**:									
Miami----------	5R	Moderate	Moderate	Slight	Slight	White oak-----------	90	5	Yellow-poplar, eastern white pine, red pine, white ash, black walnut.
						Yellow-poplar-------	98	7	
						Sweetgum------------	76	5	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
935F**:									
Hennepin	5R	Moderate	Moderate	Slight	Slight	Northern red oak	85	5	Northern red oak, white oak, green ash, black walnut, eastern white pine, red pine, eastern redcedar.
						White oak	---	---	
935G**:									
Miami	5R	Severe	Severe	Slight	Slight	White oak	90	5	Yellow-poplar, eastern white pine, red pine, white ash, black walnut.
						Yellow-poplar	98	7	
						Sweetgum	76	5	
Hennepin	5R	Severe	Severe	Slight	Slight	Northern red oak	85	5	Northern red oak, white oak, green ash, black walnut, eastern white pine, red pine, eastern redcedar.
						White oak	---	---	
2088B**:									
Sparta	4S	Slight	Slight	Severe	Slight	Northern red oak	70	4	Red pine, eastern white pine, jack pine.
						Eastern white pine	---	---	
						Red pine	---	---	
						Jack pine	---	---	
Urban land.									
2278**:									
Stronghurst	4A	Slight	Slight	Slight	Slight	White oak	70	4	Eastern white pine, red pine, Scotch pine, eastern redcedar.
						Northern red oak	70	4	
						Green ash	---	---	
						Bur oak	---	---	
Urban land.									
2279B**:									
Rozetta	4A	Slight	Slight	Slight	Slight	White oak	80	4	Eastern white pine, northern red oak, green ash, Scotch pine, yellow-poplar.
						Northern red oak	80	4	
						Yellow-poplar	90	6	
						Black walnut	---	---	
Urban land.									

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Productivity class*	Trees to plant
3028------------ Jules	4A	Slight	Slight	Moderate	Slight	Northern red oak----	80	4	Eastern white pine, black walnut, eastern cottonwood, green ash, yellow-poplar.
						White oak-----------	---	---	
						Black cherry--------	---	---	
						Sugar maple---------	---	---	
						Eastern cottonwood--	---	---	
3073------------ Ross	5A	Slight	Slight	Slight	Slight	Northern red oak----	86	5	Eastern white pine, black walnut, white ash, Norway spruce, yellow-poplar.
						Yellow-poplar-------	96	7	
						Sugar maple---------	85	4	
						White oak-----------	---	---	
						Black walnut--------	---	---	
						Black cherry--------	---	---	
						White ash-----------	---	---	
3077------------ Huntsville	7A	Slight	Slight	Slight	Slight	Yellow-poplar-------	98	7	Eastern cottonwood, American sycamore, green ash, black walnut, red maple, sugar maple, hackberry.
						Eastern cottonwood--	110	11	
						American sycamore---	---	---	
						Cherrybark oak------	---	---	
						Sweetgum------------	---	---	
						Green ash-----------	---	---	
3107------------ Sawmill	5W	Slight	Moderate	Moderate	Moderate	Pin oak-------------	90	5	American sycamore, black spruce, hackberry, European larch, green ash, pin oak, red maple, swamp white oak.
						Eastern cottonwood--	---	---	
						Sweetgum------------	---	---	
						Cherrybark oak------	---	---	
						American sycamore---	---	---	
3304------------ Landes	7A	Slight	Slight	Slight	Slight	Yellow-poplar-------	95	7	Yellow-poplar, eastern cottonwood, American sycamore, sweetgum, green ash, black walnut, eastern white pine, sugar maple.
						Eastern cottonwood--	105	10	
						American sycamore---	---	---	
						Sweetgum------------	---	---	
						Green ash-----------	---	---	
3451------------ Lawson	2W	Slight	Moderate	Slight	Slight	Silver maple--------	70	2	White spruce, silver maple, white ash.
						White ash-----------	---	---	
						Red maple-----------	---	---	
7070------------ Beaucoup	5W	Slight	Severe	Moderate	Moderate	Pin oak-------------	90	5	Eastern cottonwood, red maple, American sycamore, sweetgum, pin oak.
						Eastern cottonwood--	100	9	
						Sweetgum------------	---	---	
						Cherrybark oak------	---	---	
						American sycamore---	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
7404------------ Titus	2W	Slight	Severe	Severe	Moderate	Silver maple--------	80	2	Silver maple, eastern cottonwood, pin oak, swamp white oak, green ash, water tupelo, American sycamore, hackberry, red maple.
						Eastern cottonwood--	99	9	
						White ash-----------	51	2	
8028------------ Jules	4A	Slight	Slight	Moderate	Slight	Northern red oak----	80	4	Eastern white pine, black walnut, eastern cottonwood, green ash, yellow-poplar.
						White oak-----------	---	---	
						Black cherry--------	---	---	
						Sugar maple---------	---	---	
						Eastern cottonwood--	---	---	
8284------------ Tice	5A	Slight	Slight	Slight	Slight	Pin oak-------------	96	5	Yellow-poplar, eastern cottonwood, American sycamore, green ash, red maple, cherrybark oak.
						Sweetgum------------	86	7	
						Yellow-poplar-------	90	6	
						Virginia pine-------	90	9	
						Eastern cottonwood--	---	---	
						White ash-----------	---	---	

* Productivity class is the yield in cubic meters per hectare per year calculated at the age of culmination of mean annual increment for fully stocked natural stands.

** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS

(The symbol < means less than; > means more than. Absence of an entry indicates that trees generally do not grow to the given height on that soil)

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of-- 8-15	16-25	26-35	>35
19C2, 19D2 Sylvan	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	White fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
27C2, 27D2 Miami	Amur honeysuckle, Amur privet, American cranberrybush, silky dogwood.	White fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
36B Tama	American cranberrybush, Amur honeysuckle, Amur privet, silky dogwood.	Blue spruce, northern whitecedar, Washington hawthorn, white fir.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
36C2 Tama	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	White fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
43 Ipava	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
45 Denny	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	Austrian pine, northern whitecedar, Norway spruce, blue spruce, white fir, Washington hawthorn.	Eastern white pine	Pin oak.
54B, 54D, 54F Plainfield	Eastern redcedar, radiant crabapple, Washington hawthorn, autumn-olive, Amur honeysuckle, lilac.	Red pine, Austrian pine, jack pine.	Eastern white pine	---
61 Atterberry	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
67 Harpster	Nannyberry viburnum, Washington hawthorn.	White spruce, northern whitecedar, eastern redcedar, green ash, Osage-orange.	Black willow	---
68 Sable	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, white fir, blue spruce, northern whitecedar, Austrian pine, Norway spruce.	Eastern white pine	Pin oak.

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--			
	8-15	16-25	26-35	>35
88B, 88D: Sparta	Amur honeysuckle, lilac, eastern redcedar, radiant crabapple, Washington hawthorn, autumn-olive.	Red pine, jack pine, Austrian pine.	Eastern white pine	---
93D, 93F: Rodman	Silky dogwood, gray dogwood, Amur honeysuckle, autumn-olive, Washington hawthorn, radiant crabapple, eastern redcedar.	Black locust, jack pine, Virginia pine.	---	---
100: Palms	Amur honeysuckle, Amur privet, silky dogwood, nannyberry viburnum.	Tall purple willow	Golden willow, black willow.	Imperial Carolina poplar.
102: La Hogue	Silky dogwood, Amur honeysuckle, American cranberrybush, Amur privet.	Austrian pine, white fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce	Pin oak, eastern white pine.
103: Houghton	Amur honeysuckle, Amur privet, silky dogwood, nannyberry viburnum.	Tall purple willow	Golden willow, black willow.	Imperial Carolina poplar.
125: Selma	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, white fir, blue spruce, northern whitecedar, Austrian pine, Norway spruce.	Eastern white pine	Pin oak.
131A, 131B, 131D: Alvin	Amur privet, Washington hawthorn, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, northern whitecedar, Osage-orange, eastern redcedar.	Eastern white pine, red pine, Norway spruce.	---
134A, 134B: Camden	Amur honeysuckle, Amur privet, silky dogwood, American cranberrybush.	White fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
138: Shiloh	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Norway spruce, Austrian pine, northern whitecedar, blue spruce, white fir, Washington hawthorn.	Eastern white pine	Pin oak.
145C2: Saybrook	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	White fir, blue spruce, northern whitecedar.	Norway spruce, Austrian pine, Washington hawthorn.	Eastern white pine, pin oak.

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of-- 8-15	16-25	26-35	>35
148----------------- Proctor	Silky dogwood, Amur honeysuckle, Amur privet, American cranberrybush.	White fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce, Austrian pine.	Pin oak, eastern white pine.
150A, 150B--------- Onarga	Amur privet, Washington hawthorn, American cranberrybush, Amur honeysuckle.	Austrian pine, northern whitecedar, Osage-orange, eastern redcedar.	Red pine, Norway spruce, eastern white pine.	---
151----------------- Ridgeville	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce----------	Eastern white pine, pin oak.
152----------------- Drummer	Silky dogwood, Amur honeysuckle, Amur privet, American cranberrybush.	Norway spruce, blue spruce, northern whitecedar, Washington hawthorn, Austrian pine, white fir.	Eastern white pine----	Pin oak.
171C2-------------- Catlin	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, northern whitecedar, blue spruce, white fir.	Austrian pine, Norway spruce.	Pin oak, eastern white pine.
198----------------- Elburn	Silky dogwood, Amur honeysuckle, Amur privet, American cranberrybush.	Austrian pine, white fir, northern whitecedar, Washington hawthorn, blue spruce.	Norway spruce----------	Eastern white pine, pin oak.
199A, 199B--------- Plano	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, northern whitecedar, blue spruce, white fir.	Austrian pine, Norway spruce.	Pin oak, eastern white pine.
200----------------- Orio	American cranberrybush, Amur honeysuckle, Amur privet, silky dogwood.	Blue spruce, Norway spruce, northern whitecedar, Austrian pine, white fir, Washington hawthorn.	Eastern white pine----	Pin oak.
201----------------- Gilford	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	Norway spruce, northern whitecedar, Washington hawthorn, blue spruce, white fir, Austrian pine.	Eastern white pine----	Pin oak.
221C2-------------- Parr	Amur honeysuckle, American cranberrybush, Amur privet, silky dogwood.	White fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
224E--------------- Strawn	Amur privet, silky dogwood, Amur honeysuckle, American cranberrybush.	White fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of-- 8-15	16-25	26-35	>35
233C2, 233C3, 233D2: Birkbeck	Silky dogwood, Amur honeysuckle, Amur privet, American cranberrybush.	White fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce, Austrian pine.	Pin oak, eastern white pine.
243A, 243B, 243C2: St. Charles	Amur honeysuckle, silky dogwood, Amur privet, American cranberrybush.	White fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
266A: Disco	Amur honeysuckle, Amur privet, Washington hawthorn, American cranberrybush.	Austrian pine, northern whitecedar, Osage-orange, eastern redcedar.	Eastern white pine, Norway spruce, red pine.	---
272: Edgington	Silky dogwood, Amur honeysuckle, Amur privet, American cranberrybush.	Austrian pine, white fir, Norway spruce, northern whitecedar, blue spruce, Washington hawthorn.	Eastern white pine	Pin oak.
278: Stronghurst	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
279B2: Rozetta	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	White fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
280C2: Fayette	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	White fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
290A, 290B: Warsaw	Eastern redcedar, radiant crabapple, Washington hawthorn, autumn-olive, Amur honeysuckle, lilac.	Eastern white pine, Austrian pine, red pine, jack pine.	---	---
323C3: Casco	Eastern redcedar, lilac, radiant crabapple, autumn-olive, Washington hawthorn, Amur honeysuckle.	Eastern white pine, red pine, Austrian pine, jack pine.	---	---
329: Will	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Norway spruce, Austrian pine, northern whitecedar, blue spruce, white fir, Washington hawthorn.	Eastern white pine	Pin oak.
347: Canisteo	Washington hawthorn, nannyberry viburnum.	Osage-orange, green ash, eastern redcedar, northern whitecedar, white spruce.	Black willow	---

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--			
	8-15	16-25	26-35	>35
379A, 379B: Dakota	Eastern redcedar, radiant crabapple, Washington hawthorn, autumn-olive, Amur honeysuckle, lilac.	Eastern white pine, Austrian pine, red pine, jack pine.	---	---
386B: Downs	American cranberrybush, Amur honeysuckle, autumn-olive, silky dogwood.	Blue spruce, northern whitecedar, Washington hawthorn, white fir.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
387A: Ockley	Amur honeysuckle, American cranberrybush, Amur privet, silky dogwood.	White fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
439: Jasper	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, northern whitecedar, blue spruce, white fir.	Austrian pine, Norway spruce.	Pin oak, eastern white pine.
447: Canisteo	Washington hawthorn, Tatarian honeysuckle.	White spruce, northern whitecedar, green ash.	Black willow	---
533*. Urban land				
684B, 684C2: Broadwell	Amur honeysuckle, silky dogwood, Amur privet, American cranberrybush.	White fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce, Austrian pine.	Pin oak, eastern white pine.
689B: Coloma	Eastern redcedar, radiant crabapple, Washington hawthorn, autumn-olive, Amur honeysuckle, lilac, silky dogwood.	Austrian pine, jack pine, red pine.	Eastern white pine	---
802*. Orthents				
865*. Pits				
935F*, 935G*: Miami	Amur honeysuckle, Amur privet, American cranberrybush, silky dogwood.	White fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.

See footnote at end of table.

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of-- 8-15	16-25	26-35	>35
935F*, 935G*:				
Hennepin	Eastern redcedar, Osage-orange, Russian-olive, jack pine, Washington hawthorn, gray dogwood, silky dogwood, Amur privet, American cranberrybush.	Honeylocust, northern catalpa.	---	---
2043*:				
Ipava	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
Urban land.				
2068*:				
Sable	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, white fir, blue spruce, northern whitecedar, Austrian pine, Norway spruce.	Eastern white pine	Pin oak.
Urban land.				
2088B*:				
Sparta	Amur honeysuckle, lilac, eastern redcedar, radiant crabapple, Washington hawthorn, autumn-olive.	Red pine, jack pine, Austrian pine.	Eastern white pine	---
Urban land.				
2266B*:				
Disco	Amur honeysuckle, Amur privet, Washington hawthorn, American cranberrybush.	Austrian pine, northern whitecedar, Osage-orange, eastern redcedar.	Eastern white pine, Norway spruce, red pine.	---
Urban land.				
2278*:				
Stronghurst	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
Urban land.				
2279B*:				
Rozetta	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	White fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
Urban land.				

See footnote at end of table.

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--			
	8-15	16-25	26-35	>35
3028 Jules	Siberian peashrub	Nannyberry viburnum, Washington hawthorn, eastern redcedar, northern whitecedar, white spruce, green ash, Osage-orange.	Black willow	---
3073 Ross	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, northern whitecedar, blue spruce, white fir, Austrian pine.	Norway spruce	Pin oak, eastern white pine.
3074 Radford	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
3077 Huntsville	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
3107 Sawmill	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Norway spruce, Austrian pine, northern whitecedar, blue spruce, white fir, Washington hawthorn.	Eastern white pine	Pin oak.
3304 Landes	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	Austrian pine, white fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
3451 Lawson	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
7070 Beaucoup	Silky dogwood, Amur privet, American cranberrybush, Amur honeysuckle.	Norway spruce, Austrian pine, northern whitecedar, blue spruce, white fir, Washington hawthorn.	Eastern white pine	Pin oak.
7302 Ambraw	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	Norway spruce, Austrian pine, northern whitecedar, blue spruce, white fir, Washington hawthorn.	Eastern white pine	Pin oak.
7404 Titus	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, white fir, blue spruce, northern whitecedar, Austrian pine, Norway spruce.	Eastern white pine	Pin oak.

See footnote at end of table.

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--			
	8-15	16-25	26-35	>35
8028 Jules	Siberian peashrub	Nannyberry viburnum, Washington hawthorn, eastern redcedar, northern whitecedar, white spruce, green ash, Osage-orange.	Black willow	---
8284 Tice	Silky dogwood, Amur privet, American cranberrybush, Amur honeysuckle.	Austrian pine, white fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--RECREATIONAL DEVELOPMENT

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
19C2: Sylvan	Slight	Slight	Severe: slope.	Severe: erodes easily.	Slight.
19D2: Sylvan	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
27C2: Miami	Moderate: percs slowly.	Moderate: percs slowly.	Severe: slope.	Severe: erodes easily.	Slight.
27D2: Miami	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
36B: Tama	Slight	Slight	Moderate: slope.	Slight	Slight.
36C2: Tama	Slight	Slight	Severe: slope.	Slight	Slight.
43: Ipava	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
45: Denny	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
54B: Plainfield	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
54D: Plainfield	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.	Severe: droughty.
54F: Plainfield	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
61: Atterberry	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
67: Harpster	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
68: Sable	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
88B: Sparta	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, small stones.	Moderate: too sandy.	Moderate: droughty.
88D: Sparta	Moderate: slope, too sandy.	Moderate: slope, too sandy.	Severe: slope.	Moderate: too sandy.	Moderate: droughty, slope.
93D: Rodman	Moderate: slope.	Moderate: slope.	Severe: slope, small stones.	Slight	Severe: droughty.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
93F Rodman	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: droughty, slope.
100 Palms	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
102 La Hogue	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
103 Houghton	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
125 Selma	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
131A Alvin	Slight	Slight	Slight	Slight	Slight.
131B Alvin	Slight	Slight	Moderate: slope.	Slight	Slight.
131D Alvin	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
134A Camden	Slight	Slight	Slight	Severe: erodes easily.	Slight.
134B Camden	Slight	Slight	Moderate: slope.	Severe: erodes easily.	Slight.
138 Shiloh	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
145C2 Saybrook	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
148 Proctor	Slight	Slight	Slight	Slight	Slight.
150A Onarga	Slight	Slight	Slight	Slight	Slight.
150B Onarga	Slight	Slight	Moderate: slope.	Slight	Slight.
151 Ridgeville	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
152 Drummer	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
171C2 Catlin	Slight	Slight	Severe: slope.	Slight	Slight.
198 Elburn	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
199A Plano	Slight	Slight	Slight	Slight	Slight.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
199B Plano	Slight	Slight	Moderate: slope.	Slight	Slight.
200 Orio	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
201 Gilford	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
221C2 Parr	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight	Moderate: slope.
224E Strawn	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
233C2, 233C3 Birkbeck	Slight	Slight	Severe: slope.	Severe: erodes easily.	Slight.
233D2 Birkbeck	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
243A St. Charles	Slight	Slight	Slight	Severe: erodes easily.	Slight.
243B St. Charles	Slight	Slight	Moderate: slope.	Severe: erodes easily.	Slight.
243C2 St. Charles	Slight	Slight	Severe: slope.	Severe: erodes easily.	Slight.
266A Disco	Slight	Slight	Slight	Slight	Slight.
272 Edgington	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
278 Stronghurst	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
279B2 Rozetta	Slight	Slight	Moderate: slope.	Slight	Slight.
280C2 Fayette	Slight	Slight	Severe: slope.	Severe: erodes easily.	Slight.
290A Warsaw	Slight	Slight	Moderate: small stones.	Slight	Slight.
290B Warsaw	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
323C3 Casco	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: droughty, slope.
329 Will	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
347 Canisteo	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
379A ------------------ Dakota	Slight ----------	Slight ----------	Moderate: small stones.	Slight ----------	Slight.
379B ------------------ Dakota	Slight ----------	Slight ----------	Moderate: slope, small stones.	Slight ----------	Slight.
386B ------------------ Downs	Slight ----------	Slight ----------	Moderate: slope.	Slight ----------	Slight.
387A ------------------ Ockley	Slight ----------	Slight ----------	Moderate: small stones.	Slight ----------	Slight.
439 ------------------- Jasper	Slight ----------	Slight ----------	Slight ----------	Slight ----------	Slight.
447 ------------------- Canisteo	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
533*. Urban land					
684B ------------------ Broadwell	Slight ----------	Slight ----------	Moderate: slope.	Slight ----------	Slight.
684C2 ----------------- Broadwell	Slight ----------	Slight ----------	Severe: slope.	Slight ----------	Slight.
689B ------------------ Coloma	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
802* ------------------ Orthents	Slight ----------	Slight ----------	Moderate: slope.	Slight ----------	Slight.
865*. Pits					
935F*, 935G*:					
Miami -----------------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
Hennepin --------------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
2043*:					
Ipava -----------------	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
Urban land.					
2068*:					
Sable -----------------	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
Urban land.					

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
2088B*:					
Sparta	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, small stones.	Moderate: too sandy.	Moderate: droughty.
Urban land.					
2266B*:					
Disco	Slight	Slight	Moderate: slope.	Slight	Slight.
Urban land.					
2278*:					
Stronghurst	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
Urban land.					
2279B*:					
Rozetta	Slight	Slight	Moderate: slope.	Slight	Slight.
Urban land.					
3028 Jules	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.	Severe: flooding.
3073 Ross	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.	Severe: flooding.
3074 Radford	Severe: flooding, wetness.	Moderate: flooding, wetness.	Severe: wetness, flooding.	Moderate: wetness, flooding.	Severe: flooding.
3077 Huntsville	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.	Severe: flooding.
3107 Sawmill	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
3304 Landes	Severe: flooding.	Moderate: flooding.	Slight	Moderate: flooding.	Severe: flooding.
3451 Lawson	Severe: flooding, wetness.	Moderate: flooding, wetness.	Severe: wetness, flooding.	Moderate: wetness, flooding.	Severe: flooding.
7070 Beaucoup	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
7302 Ambraw	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
7404 Titus	Severe: flooding, ponding, too clayey.	Severe: ponding, too clayey.	Severe: too clayey, ponding.	Severe: ponding, too clayey.	Severe: ponding, too clayey.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
8028 Jules	Severe: flooding.	Slight	Moderate: flooding.	Slight	Moderate: flooding.
8284 Tice	Severe: flooding.	Moderate: wetness.	Moderate: wetness, flooding.	Moderate: wetness.	Moderate: wetness, flooding.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--WILDLIFE HABITAT

(See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
19C2, 19D2 Sylvan	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
27C2 Miami	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
27D2 Miami	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
36B Tama	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
36C2 Tama	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
43 Ipava	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
45 Denny	Poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
54B Plainfield	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
54D, 54F Plainfield	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
61 Atterberry	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
67 Harpster	Fair	Fair	Good	Fair	Fair	Good	Fair	Fair	Fair	Fair.
68 Sable	Fair	Good	Good	Fair	Fair	Good	Good	Good	Fair	Good.
88B Sparta	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
88D Sparta	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
93D, 93F Rodman	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
100 Palms	Poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
102 La Hogue	Good	Good	Good	Good	Fair	Fair	Poor	Good	Good	Poor.
103 Houghton	Poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
125 Selma	Good	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.

TABLE 10.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
131A---------------Alvin	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
131B, 131D---------Alvin	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
134A, 134B---------Camden	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
138----------------Shiloh	Fair	Fair	Fair	Fair	Poor	Good	Good	Fair	Fair	Good.
145C2--------------Saybrook	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
148----------------Proctor	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
150A---------------Onarga	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
150B---------------Onarga	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
151----------------Ridgeville	Good	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
152----------------Drummer	Fair	Good	Good	Fair	Fair	Good	Good	Good	Fair	Good.
171C2--------------Catlin	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
198----------------Elburn	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
199A, 199B---------Plano	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
200----------------Orio	Poor	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
201----------------Gilford	Fair	Poor	Poor	Poor	Poor	Good	Good	Fair	Poor	Good.
221C2--------------Parr	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
224E---------------Strawn	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
233C2, 233C3, 233D2-------------Birkbeck	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
243A, 243B---------St. Charles	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
243C2--------------St. Charles	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.

TABLE 10.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
266A----- Disco	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
272----- Edgington	Fair	Fair	Good	Fair	Fair	Good	Good	Fair	Fair	Good.
278----- Stronghurst	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
279B2----- Rozetta	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
280C2----- Fayette	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
290A, 290B----- Warsaw	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
323C3----- Casco	Fair	Fair	Fair	Poor	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
329----- Will	Fair	Good	Good	Good	Fair	Good	Good	Good	Good	Good.
347----- Canisteo	Fair	Fair	Fair	Fair	Poor	Good	Good	Fair	Poor	Good.
379A, 379B----- Dakota	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
386B----- Downs	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
387A----- Ockley	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
439----- Jasper	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
447----- Canisteo	Good	Good	Fair	Fair	Fair	Good	Good	Fair	Fair	Fair.
533*. Urban land										
684B, 684C2----- Broadwell	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
689B----- Coloma	Fair	Fair	Fair	Fair	Good	Very poor.	Very poor.	Fair	Fair	Very poor.
802*. Orthents										
865*. Pits										
935F*, 935G*: Miami-----	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.

See footnote at end of table.

TABLE 10.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
935F*, 935G*:										
Hennepin	Very poor.	Poor	Good	Good	Fair	Very poor.	Very poor.	Poor	Good	Very poor.
2043*:										
Ipava	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Urban land.										
2068*:										
Sable	Fair	Good	Good	Fair	Fair	Good	Good	Good	Fair	Good.
Urban land.										
2088B*:										
Sparta	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Urban land.										
2266B*:										
Disco	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Urban land.										
2278*:										
Stronghurst	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Urban land.										
2279B*:										
Rozetta	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Urban land.										
3028 Jules	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
3073 Ross	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
3074 Radford	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
3077 Huntsville	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
3107 Sawmill	Good	Good	Good	Fair	Fair	Good	Fair	Good	Fair	Fair.
3304 Landes	Poor	Fair	Fair	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
3451 Lawson	Poor	Fair	Fair	Good	Good	Fair	Fair	Fair	Good	Fair.
7070 Beaucoup	Good	Good	Good	Fair	Fair	Good	Good	Good	Fair	Good.

See footnote at end of table.

TABLE 10.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba-ceous plants	Hardwood trees	Conif-erous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
7302---------------- Ambraw	Good	Fair	Good	Good	Fair	Good	Good	Good	Good	Good.
7404---------------- Titus	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
8028---------------- Jules	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
8284---------------- Tice	Poor	Fair	Fair	Good	Good	Fair	Fair	Fair	Good	Fair.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--BUILDING SITE DEVELOPMENT

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
19C2: Sylvan	Slight	Moderate: shrink-swell.	Slight	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
19D2: Sylvan	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope.	Severe: slope.	Severe: low strength, frost action.	Moderate: slope.
27C2: Miami	Moderate: dense layer.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
27D2: Miami	Moderate: dense layer, slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
36B: Tama	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
36C2: Tama	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
43: Ipava	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell, low strength, frost action.	Moderate: wetness.
45: Denny	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: shrink-swell, low strength, ponding.	Severe: ponding.
54B: Plainfield	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Severe: droughty.
54D: Plainfield	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Severe: droughty.
54F: Plainfield	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
61: Atterberry	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
67: Harpster	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: ponding.
68: Sable	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: ponding.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
88B--------------- Sparta	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Slight---------	Moderate: droughty.
88D--------------- Sparta	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
93D--------------- Rodman	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Severe: droughty.
93F--------------- Rodman	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: droughty, slope.
100--------------- Palms	Severe: excess humus, ponding.	Severe: subsides, ponding.	Severe: subsides, ponding.	Severe: subsides, ponding.	Severe: subsides, ponding, frost action.	Severe: ponding, excess humus.
102--------------- La Hogue	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action.	Moderate: wetness.
103--------------- Houghton	Severe: excess humus, ponding.	Severe: subsides, ponding.	Severe: subsides, ponding.	Severe: subsides, ponding.	Severe: subsides, ponding, frost action.	Severe: ponding, excess humus.
125--------------- Selma	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding, frost action.	Severe: ponding.
131A-------------- Alvin	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Moderate: frost action.	Slight.
131B-------------- Alvin	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Moderate: frost action.	Slight.
131D-------------- Alvin	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope.
134A, 134B-------- Camden	Slight---------	Moderate: shrink-swell.	Slight---------	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
138--------------- Shiloh	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: shrink-swell, low strength, ponding.	Severe: ponding.
145C2------------- Saybrook	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: low strength, frost action.	Moderate: slope.
148--------------- Proctor	Severe: cutbanks cave.	Moderate: shrink-swell.	Slight---------	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
150A-------------- Onarga	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Moderate: frost action.	Slight.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
150B: Onarga	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Moderate: frost action.	Slight.
151: Ridgeville	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action.	Moderate: wetness.
152: Drummer	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: ponding.
171C2: Catlin	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
198: Elburn	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
199A: Plano	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
199B: Plano	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
200: Orio	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding, frost action.	Severe: ponding.
201: Gilford	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding, frost action.	Severe: ponding.
221C2: Parr	Moderate: dense layer, slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Moderate: shrink-swell, low strength, slope.	Moderate: slope.
224E: Strawn	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
233C2, 233C3: Birkbeck	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
233D2: Birkbeck	Moderate: wetness, slope.	Moderate: shrink-swell, slope.	Moderate: wetness, slope, shrink-swell.	Severe: slope.	Severe: low strength, frost action.	Moderate: slope.
243A, 243B: St. Charles	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
243C2: St. Charles	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
266A: Disco	Severe: cutbanks cave.	Slight	Slight	Slight	Moderate: frost action.	Slight.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
272 Edgington	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: ponding.
278 Stronghurst	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
279B2 Rozetta	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
280C2 Fayette	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
290A Warsaw	Severe: cutbanks cave.	Slight	Slight	Slight	Moderate: frost action.	Slight.
290B Warsaw	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Moderate: frost action.	Slight.
323C3 Casco	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
329 Will	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding.	Severe: ponding.
347 Canisteo	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: ponding.
379A, 379B Dakota	Severe: cutbanks cave.	Slight	Slight	Slight	Moderate: low strength, frost action.	Slight.
386B Downs	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
387A Ockley	Severe: cutbanks cave.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, low strength.	Slight.
439 Jasper	Severe: cutbanks cave.	Slight	Slight	Slight	Moderate: frost action.	Slight.
447 Canisteo	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness.	Severe: wetness.
533*. Urban land						
684B Broadwell	Severe: cutbanks cave.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
684C2 Broadwell	Severe: cutbanks cave.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
689B Coloma	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Severe: droughty.
802* Orthents	Slight	Slight	Slight	Moderate: slope.	Slight	Slight.
865*. Pits						
935F*, 935G*:						
Miami	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
Hennepin	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
2043*:						
Ipava	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell, low strength, frost action.	Moderate: wetness.
Urban land.						
2068*:						
Sable	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: ponding.
Urban land.						
2088B*:						
Sparta	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
Urban land.						
2266B*:						
Disco	Severe: cutbanks cave.	Slight	Slight	Slight	Moderate: frost action.	Slight.
Urban land.						
2278*:						
Stronghurst	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
Urban land.						
2279B*:						
Rozetta	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
2279B*: Urban land.						
3028-------------- Jules	Moderate: cutbanks cave, wetness, flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding, frost action.	Severe: flooding.
3073-------------- Ross	Moderate: wetness, flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
3074-------------- Radford	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, flooding, frost action.	Severe: flooding.
3077-------------- Huntsville	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength, flooding, frost action.	Severe: flooding.
3107-------------- Sawmill	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness.
3304-------------- Landes	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
3451-------------- Lawson	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, frost action.	Severe: flooding.
7070-------------- Beaucoup	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: low strength, ponding.	Severe: ponding.
7302-------------- Ambraw	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness.
7404-------------- Titus	Severe: ponding.	Severe: flooding, ponding, shrink-swell.	Severe: flooding, ponding, shrink-swell.	Severe: flooding, ponding, shrink-swell.	Severe: shrink-swell, low strength, ponding.	Severe: ponding, too clayey.
8028-------------- Jules	Moderate: cutbanks cave, wetness, flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding, frost action.	Moderate: flooding.
8284-------------- Tice	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: low strength, flooding, frost action.	Moderate: wetness, flooding.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--SANITARY FACILITIES

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "good," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
19C2: Sylvan	Slight	Severe: slope.	Slight	Slight	Good.
19D2: Sylvan	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: slope.
27C2: Miami	Severe: percs slowly.	Severe: slope.	Slight	Slight	Good.
27D2: Miami	Severe: percs slowly.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: slope.
36B: Tama	Moderate: wetness.	Moderate: seepage, slope.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
36C2: Tama	Slight	Severe: slope.	Moderate: too clayey.	Slight	Fair: too clayey.
43: Ipava	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
45: Denny	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.
54B: Plainfield	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
54D: Plainfield	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
54F: Plainfield	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, slope.
61: Atterberry	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: hard to pack, wetness.
67: Harpster	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.
68: Sable	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: hard to pack, ponding.
88B: Sparta	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
88D: Sparta	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
93D: Rodman	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
93F: Rodman	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, small stones.
100: Palms	Severe: subsides, ponding, percs slowly.	Severe: seepage, excess humus, ponding.	Severe: ponding, excess humus.	Severe: seepage, ponding.	Poor: ponding, excess humus.
102: La Hogue	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: wetness.
103: Houghton	Severe: subsides, ponding, percs slowly.	Severe: seepage, excess humus, ponding.	Severe: seepage, ponding, excess humus.	Severe: seepage, ponding.	Poor: ponding, excess humus.
125: Selma	Severe: ponding.	Severe: seepage, ponding.	Severe: seepage, ponding.	Severe: ponding.	Poor: ponding.
131A, 131B: Alvin	Slight	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage.
131D: Alvin	Moderate: slope.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage.
134A: Camden	Slight	Moderate: seepage.	Severe: seepage.	Slight	Fair: too clayey.
134B: Camden	Slight	Moderate: seepage, slope.	Severe: seepage.	Slight	Fair: too clayey.
138: Shiloh	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
145C2: Saybrook	Severe: percs slowly.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: slope.
148: Proctor	Moderate: percs slowly.	Severe: seepage.	Severe: seepage, too sandy.	Slight	Poor: too sandy.
150A, 150B: Onarga	Severe: poor filter.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: thin layer.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
151: Ridgeville	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: wetness.	Poor: seepage, too sandy, wetness.
152: Drummer	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.
171C2: Catlin	Severe: wetness.	Severe: slope.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
198: Elburn	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: wetness.	Poor: wetness.
199A: Plano	Slight	Severe: seepage.	Severe: seepage.	Slight	Fair: too clayey.
199B: Plano	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
200: Orio	Severe: ponding, percs slowly.	Severe: seepage, ponding.	Severe: seepage, ponding, too sandy.	Severe: ponding.	Poor: seepage, too sandy, ponding.
201: Gilford	Severe: ponding, poor filter.	Severe: seepage, ponding.	Severe: seepage, ponding.	Severe: seepage, ponding.	Poor: ponding, thin layer.
221C2: Parr	Severe: percs slowly.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope.
224E: Strawn	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
233C2, 233C3: Birkbeck	Severe: wetness, percs slowly.	Severe: slope, wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
233D2: Birkbeck	Severe: wetness, percs slowly.	Severe: slope, wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, slope, wetness.
243A: St. Charles	Slight	Moderate: seepage.	Moderate: too clayey.	Slight	Fair: too clayey.
243B: St. Charles	Slight	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey.
243C2: St. Charles	Slight	Severe: slope.	Moderate: too clayey.	Slight	Fair: too clayey.
266A: Disco	Severe: poor filter.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: thin layer.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
272 Edgington	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.
278 Stronghurst	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: hard to pack, wetness.
279B2 Rozetta	Moderate: wetness.	Moderate: seepage, slope, wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
280C2 Fayette	Slight	Severe: slope.	Moderate: too clayey.	Slight	Fair: too clayey.
290A, 290B Warsaw	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
323C3 Casco	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
329 Will	Severe: ponding, poor filter.	Severe: seepage, ponding.	Severe: seepage, ponding.	Severe: seepage, ponding.	Poor: seepage, too sandy, small stones.
347 Canisteo	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.
379A, 379B Dakota	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
386B Downs	Moderate: wetness.	Moderate: seepage, slope, wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
387A Ockley	Slight	Severe: seepage.	Severe: seepage.	Slight	Poor: small stones.
439 Jasper	Slight	Severe: seepage.	Severe: seepage.	Slight	Fair: too clayey, thin layer.
447 Canisteo	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: wetness.	Poor: wetness.
533*. Urban land					
684B Broadwell	Slight	Severe: seepage.	Severe: seepage.	Slight	Fair: too clayey, thin layer.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
684C2: Broadwell	Slight	Severe: seepage, slope.	Severe: seepage.	Slight	Fair: too clayey, thin layer.
689B: Coloma	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
802*: Orthents	Moderate: percs slowly.	Moderate: seepage, slope.	Slight	Slight	Good.
865*. Pits					
935F*, 935G*:					
Miami	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Hennepin	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
2043*:					
Ipava	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
Urban land.					
2068*:					
Sable	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: hard to pack, ponding.
Urban land.					
2088B*:					
Sparta	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Urban land.					
2266B*:					
Disco	Severe: poor filter.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: thin layer.
Urban land.					
2278*:					
Stronghurst	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: hard to pack, wetness.
Urban land.					

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
2279B*:					
Rozetta	Moderate: wetness.	Moderate: seepage, slope, wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
Urban land.					
3028 Jules	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Good.
3073 Ross	Severe: flooding.	Severe: seepage, flooding.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage.	Good.
3074 Radford	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
3077 Huntsville	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Good.
3107 Sawmill	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
3304 Landes	Severe: flooding, poor filter.	Severe: seepage, flooding.	Severe: flooding, seepage, too sandy.	Severe: flooding, seepage.	Poor: seepage, too sandy.
3451 Lawson	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
7070 Beaucoup	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.
7302 Ambraw	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
7404 Titus	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
8028 Jules	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Good.
8284 Tice	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: hard to pack.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--CONSTRUCTION MATERIALS

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
19C2: Sylvan	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
19D2: Sylvan	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, slope.
27C2: Miami	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, too clayey.
27D2: Miami	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, too clayey, slope.
36B, 36C2: Tama	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
43: Ipava	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
45: Denny	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
54B, 54D: Plainfield	Good	Probable	Improbable: too sandy.	Poor: too sandy.
54F: Plainfield	Poor: slope.	Probable	Improbable: too sandy.	Poor: too sandy, slope.
61: Atterberry	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
67: Harpster	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
68: Sable	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
88B, 88D: Sparta	Good	Probable	Improbable: too sandy.	Poor: too sandy.
93D: Rodman	Good	Probable	Probable	Poor: too sandy, small stones, area reclaim.
93F: Rodman	Poor: slope.	Probable	Probable	Poor: too sandy, small stones, area reclaim.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
100 Palms	Poor: wetness.	Improbable: excess humus.	Improbable: excess humus.	Poor: excess humus, wetness.
102 La Hogue	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
103 Houghton	Poor: wetness.	Improbable: excess humus.	Improbable: excess humus.	Poor: excess humus, wetness.
125 Selma	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
131A, 131B, 131D Alvin	Good	Probable	Improbable: too sandy.	Poor: too sandy.
134A, 134B Camden	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
138 Shiloh	Poor: shrink-swell, low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
145C2 Saybrook	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, slope.
148 Proctor	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
150A, 150B Onarga	Good	Probable	Improbable: too sandy.	Fair: area reclaim, thin layer.
151 Ridgeville	Fair: wetness.	Probable	Improbable: too sandy.	Good.
152 Drummer	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
171C2 Catlin	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
198 Elburn	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
199A, 199B Plano	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
200 Orio	Poor: wetness.	Probable	Improbable: too sandy.	Poor: wetness.
201 Gilford	Poor: wetness.	Probable	Improbable: too sandy.	Poor: wetness.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
221C2 Parr	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, too clayey, slope.
224E Strawn	Fair: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
233C2, 233C3 Birkbeck	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
233D2 Birkbeck	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, slope.
243A, 243B, 243C2 St. Charles	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, area reclaim.
266A Disco	Good	Probable	Improbable: too sandy.	Good.
272 Edgington	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
278 Stronghurst	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
279B2 Rozetta	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
280C2 Fayette	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
290A, 290B Warsaw	Good	Probable	Probable	Poor: small stones, area reclaim.
323C3 Casco	Good	Probable	Probable	Poor: too sandy, small stones, area reclaim.
329 Will	Poor: wetness.	Probable	Probable	Poor: area reclaim, wetness.
347 Canisteo	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
379A, 379B Dakota	Good	Probable	Probable	Poor: small stones, area reclaim.
386B Downs	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
387A Ockley	Good	Probable	Probable	Poor: small stones, area reclaim.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
439 Jasper	Good	Probable	Improbable: too sandy.	Good.
447 Canisteo	Poor: wetness.	Probable	Improbable: too sandy.	Poor: wetness.
533*. Urban land				
684B, 684C2 Broadwell	Good	Probable	Improbable: too sandy.	Good.
689B Coloma	Good	Probable	Improbable: too sandy.	Poor: too sandy, small stones.
802* Orthents	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
865*. Pits				
935F*, 935G*:				
Miami	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Hennepin	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, slope.
2043*:				
Ipava	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Urban land.				
2068*:				
Sable	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Urban land.				
2088B*:				
Sparta	Good	Probable	Improbable: too sandy.	Poor: too sandy.
Urban land.				
2266B*:				
Disco	Good	Probable	Improbable: too sandy.	Good.
Urban land.				
2278*:				
Stronghurst	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
Urban land.				

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
2279B*:				
Rozetta	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
Urban land.				
3028 Jules	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
3073 Ross	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
3074 Radford	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
3077 Huntsville	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
3107 Sawmill	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
3304 Landes	Good	Probable	Improbable: too sandy.	Fair: too sandy, small stones, thin layer.
3451 Lawson	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
7070 Beaucoup	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
7302 Ambraw	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
7404 Titus	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
8028 Jules	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
8284 Tice	Fair: shrink-swell, low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--WATER MANAGEMENT

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
19C2-------------- Sylvan	Moderate: seepage, slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
19D2-------------- Sylvan	Severe: slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
27C2-------------- Miami	Moderate: seepage, slope.	Severe: piping.	Deep to water	Slope, percs slowly.	Erodes easily	Erodes easily, rooting depth.
27D2-------------- Miami	Severe: slope.	Severe: piping.	Deep to water	Slope, percs slowly.	Slope, erodes easily.	Slope, erodes easily, rooting depth.
36B, 36C2--------- Tama	Moderate: seepage, slope.	Slight---------	Deep to water	Slope----------	Erodes easily	Erodes easily.
43---------------- Ipava	Slight---------	Severe: wetness.	Frost action---	Wetness--------	Erodes easily, wetness.	Wetness, erodes easily.
45---------------- Denny	Slight---------	Severe: ponding.	Ponding, percs slowly, frost action.	Ponding, percs slowly, erodes easily.	Erodes easily, ponding.	Wetness, erodes easily, percs slowly.
54B--------------- Plainfield	Severe: seepage.	Severe: seepage, piping.	Deep to water	Slope, droughty, fast intake.	Too sandy, soil blowing.	Droughty.
54D, 54F---------- Plainfield	Severe: seepage, slope.	Severe: seepage, piping.	Deep to water	Slope, droughty, fast intake.	Slope, too sandy, soil blowing.	Slope, droughty.
61---------------- Atterberry	Moderate: seepage.	Severe: wetness.	Frost action---	Wetness--------	Erodes easily, wetness.	Wetness, erodes easily.
67---------------- Harpster	Moderate: seepage.	Severe: piping, ponding.	Ponding, frost action.	Ponding--------	Ponding--------	Wetness.
68---------------- Sable	Moderate: seepage.	Severe: ponding.	Ponding, frost action.	Ponding--------	Ponding--------	Wetness.
88B--------------- Sparta	Severe: seepage.	Severe: seepage, piping.	Deep to water	Slope, droughty, fast intake.	Too sandy, soil blowing.	Droughty.
88D--------------- Sparta	Severe: seepage, slope.	Severe: seepage, piping.	Deep to water	Slope, droughty, fast intake.	Slope, too sandy, soil blowing.	Slope, droughty.
93D, 93F---------- Rodman	Severe: seepage, slope.	Severe: seepage.	Deep to water	Slope, droughty.	Slope, too sandy.	Slope, droughty.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
100 Palms	Severe: seepage.	Severe: excess humus, ponding.	Ponding, subsides, frost action.	Ponding, soil blowing.	Ponding, soil blowing.	Wetness, rooting depth.
102 La Hogue	Severe: seepage.	Severe: thin layer, wetness.	Frost action	Wetness	Wetness	Wetness, rooting depth.
103 Houghton	Severe: seepage.	Severe: excess humus, ponding.	Ponding, subsides, frost action.	Ponding, soil blowing.	Ponding, soil blowing.	Wetness.
125 Selma	Severe: seepage.	Severe: ponding.	Ponding, frost action.	Ponding	Ponding	Wetness.
131A Alvin	Severe: seepage.	Severe: seepage, piping.	Deep to water	Fast intake, soil blowing.	Soil blowing	Favorable.
131B Alvin	Severe: seepage.	Severe: seepage, piping.	Deep to water	Slope, fast intake, soil blowing.	Soil blowing	Favorable.
131D Alvin	Severe: seepage, slope.	Severe: seepage, piping.	Deep to water	Slope, soil blowing.	Slope, soil blowing.	Slope.
134A Camden	Moderate: seepage.	Severe: piping.	Deep to water	Erodes easily	Erodes easily	Erodes easily.
134B Camden	Moderate: seepage, slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
138 Shiloh	Slight	Severe: ponding.	Ponding, frost action.	Ponding	Ponding	Wetness.
145C2 Saybrook	Severe: slope.	Moderate: piping.	Deep to water	Slope	Slope, erodes easily.	Slope, erodes easily.
148 Proctor	Severe: seepage.	Severe: piping.	Deep to water	Favorable	Erodes easily, too sandy.	Erodes easily.
150A Onarga	Severe: seepage.	Severe: piping.	Deep to water	Soil blowing	Soil blowing	Favorable.
150B Onarga	Severe: seepage.	Severe: piping.	Deep to water	Soil blowing, slope.	Soil blowing	Favorable.
151 Ridgeville	Severe: seepage.	Severe: seepage, piping, wetness.	Frost action, cutbanks cave.	Wetness, soil blowing.	Wetness, too sandy, soil blowing.	Wetness.
152 Drummer	Moderate: seepage.	Severe: ponding.	Ponding, frost action.	Ponding	Ponding	Wetness.
171C2 Catlin	Moderate: seepage, slope.	Moderate: piping, wetness.	Deep to water	Slope	Erodes easily	Erodes easily.
198 Elburn	Severe: seepage.	Severe: wetness.	Frost action	Wetness	Erodes easily, wetness.	Wetness, erodes easily.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
199A: Plano	Severe: seepage.	Moderate: thin layer, piping.	Deep to water	Favorable	Erodes easily	Erodes easily.
199B: Plano	Moderate: seepage, slope.	Moderate: thin layer, piping, wetness.	Deep to water	Slope	Erodes easily	Erodes easily.
200: Orio	Moderate: seepage.	Severe: seepage, piping, ponding.	Ponding, frost action, cutbanks cave.	Ponding, soil blowing.	Ponding, too sandy, soil blowing.	Wetness.
201: Gilford	Severe: seepage.	Severe: piping, ponding.	Ponding, frost action.	Ponding, soil blowing, rooting depth.	Ponding, soil blowing.	Wetness, rooting depth.
221C2: Parr	Severe: slope.	Severe: thin layer.	Deep to water	Slope, percs slowly.	Slope	Slope, rooting depth, percs slowly.
224E: Strawn	Severe: slope.	Moderate: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
233C2, 233C3: Birkbeck	Moderate: seepage, slope.	Moderate: thin layer, piping, wetness.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
233D2: Birkbeck	Severe: slope.	Moderate: thin layer, piping, wetness.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
243A: St. Charles	Moderate: seepage.	Moderate: thin layer, piping.	Deep to water	Erodes easily	Erodes easily	Erodes easily.
243B, 243C2: St. Charles	Moderate: seepage, slope.	Moderate: thin layer, piping.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
266A: Disco	Severe: seepage.	Severe: piping.	Deep to water	Soil blowing	Soil blowing	Favorable.
272: Edgington	Slight	Severe: ponding.	Ponding, percs slowly, frost action.	Ponding, percs slowly.	Ponding, percs slowly.	Wetness, percs slowly.
278: Stronghurst	Moderate: seepage.	Severe: wetness.	Frost action	Wetness, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily.
279B2: Rozetta	Moderate: seepage, slope.	Slight	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
280C2: Fayette	Moderate: seepage, slope.	Slight	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
290A: Warsaw	Severe: seepage.	Severe: seepage.	Deep to water	Favorable	Too sandy	Favorable.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
290B-------------- Warsaw	Severe: seepage.	Severe: seepage.	Deep to water	Slope----------	Too sandy------	Favorable.
323C3------------- Casco	Severe: seepage, slope.	Severe: seepage, piping.	Deep to water	Slope, droughty.	Slope, too sandy.	Slope, droughty, rooting depth.
329--------------- Will	Severe: seepage.	Severe: seepage, ponding.	Ponding, frost action.	Ponding, rooting depth.	Ponding, too sandy.	Wetness, rooting depth.
347--------------- Canisteo	Moderate: seepage.	Severe: ponding.	Ponding, frost action.	Ponding--------	Ponding--------	Wetness.
379A-------------- Dakota	Severe: seepage.	Severe: seepage, piping.	Deep to water	Favorable------	Too sandy------	Favorable.
379B-------------- Dakota	Severe: seepage.	Severe: seepage, piping.	Deep to water	Slope----------	Too sandy------	Favorable.
386B-------------- Downs	Moderate: seepage, slope.	Slight---------	Deep to water	Slope----------	Erodes easily	Erodes easily.
387A-------------- Ockley	Severe: seepage.	Moderate: thin layer, piping.	Deep to water	Soil blowing---	Erodes easily, soil blowing.	Erodes easily.
439--------------- Jasper	Severe: seepage.	Severe: piping.	Deep to water	Favorable------	Favorable------	Favorable.
447--------------- Canisteo	Severe: seepage.	Severe: wetness.	Frost action---	Wetness--------	Wetness--------	Wetness.
533*. Urban land						
684B, 684C2------- Broadwell	Severe: seepage.	Moderate: thin layer, piping.	Deep to water	Slope----------	Erodes easily	Erodes easily.
689B-------------- Coloma	Severe: seepage.	Severe: seepage, piping.	Deep to water	Slope, droughty, fast intake.	Too sandy, soil blowing.	Droughty.
802*-------------- Orthents	Moderate: seepage, slope.	Slight---------	Deep to water	Slope, droughty.	Soil blowing---	Droughty.
865*. Pits						
935F*, 935G*:						
Miami------------	Severe: slope.	Severe: piping.	Deep to water	Slope, percs slowly.	Slope, erodes easily.	Slope, erodes easily, rooting depth.
Hennepin---------	Severe: slope.	Severe: piping.	Deep to water	Slope, rooting depth.	Slope----------	Slope, rooting depth.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
2043*:						
Ipava	Slight	Severe: wetness.	Frost action	Wetness	Erodes easily, wetness.	Wetness, erodes easily.
Urban land.						
2068*:						
Sable	Moderate: seepage.	Severe: ponding.	Ponding, frost action.	Ponding	Ponding	Wetness.
Urban land.						
2088B*:						
Sparta	Severe: seepage.	Severe: seepage, piping.	Deep to water	Slope, droughty, fast intake.	Too sandy, soil blowing.	Droughty.
Urban land.						
2266B*:						
Disco	Severe: seepage.	Severe: piping.	Deep to water	Slope, soil blowing.	Soil blowing	Favorable.
Urban land.						
2278*:						
Stronghurst	Moderate: seepage.	Severe: wetness.	Frost action	Wetness, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily.
Urban land.						
2279B*:						
Rozetta	Moderate: seepage, slope.	Slight	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
Urban land.						
3028 Jules	Moderate: seepage.	Severe: piping.	Deep to water	Erodes easily, flooding.	Erodes easily	Erodes easily.
3073 Ross	Severe: seepage.	Severe: piping.	Deep to water	Flooding	Favorable	Favorable.
3074 Radford	Moderate: seepage.	Severe: wetness.	Flooding, frost action.	Wetness, flooding.	Wetness	Wetness.
3077 Huntsville	Moderate: seepage.	Moderate: thin layer, piping.	Deep to water	Flooding	Favorable	Favorable.
3107 Sawmill	Moderate: seepage.	Severe: wetness.	Frost action	Wetness	Wetness	Wetness.
3304 Landes	Severe: seepage.	Severe: seepage, piping.	Deep to water	Favorable	Too sandy, soil blowing.	Favorable.
3451 Lawson	Moderate: seepage.	Severe: wetness.	Flooding, frost action.	Wetness, flooding.	Erodes easily, wetness.	Wetness, erodes easily.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
7070 Beaucoup	Slight	Severe: ponding.	Ponding, frost action.	Ponding	Ponding	Wetness.
7302 Ambraw	Moderate: seepage.	Severe: piping, wetness.	Frost action	Wetness	Erodes easily, wetness.	Wetness, erodes easily.
7404 Titus	Slight	Severe: ponding.	Ponding, percs slowly.	Ponding, slow intake, percs slowly.	Ponding, percs slowly.	Wetness, rooting depth, percs slowly.
8028 Jules	Moderate: seepage.	Severe: piping.	Deep to water	Erodes easily, flooding.	Erodes easily	Erodes easily.
8284 Tice	Moderate: seepage.	Severe: wetness.	Flooding, frost action.	Wetness	Wetness	Favorable.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--ENGINEERING INDEX PROPERTIES

(The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated)

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments >3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
19C2, 19D2---- Sylvan	0-7	Silt loam-----	CL-ML, CL	A-4, A-6	0	100	100	100	95-100	25-35	5-15
	7-33	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	100	95-100	35-50	20-30
	33-60	Silt loam, silt.	CL, CL-ML	A-6, A-4	0	100	100	95-100	95-100	20-40	5-20
27C2, 27D2---- Miami	0-7	Silt loam-----	CL, CL-ML, ML	A-4	0	100	95-100	80-100	50-90	15-30	3-10
	7-27	Clay loam, silty clay loam.	CL, SC	A-6	0	90-100	85-100	70-95	40-95	30-40	15-25
	27-60	Loam, clay loam, silt loam.	CL, SC	A-4, A-6	0-3	85-100	85-100	70-90	40-90	25-35	8-15
36B----------- Tama	0-12	Silt loam-----	ML, CL	A-6, A-7	0	100	100	100	95-100	35-45	10-20
	12-44	Silty clay loam.	CL	A-7	0	100	100	100	95-100	40-50	15-25
	44-60	Silt loam, silty clay loam.	CL	A-6, A-7	0	100	100	100	95-100	35-45	15-25
36C2---------- Tama	0-9	Silt loam-----	CL, CL-ML	A-6, A-4	0	100	100	100	95-100	25-40	5-15
	9-44	Silty clay loam.	ML	A-6, A-7	0	100	100	100	95-100	35-50	10-20
	44-52	Silty clay loam.	CL	A-7	0	100	100	100	95-100	40-50	15-25
	52-60	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	100	95-100	35-45	15-25
43------------ Ipava	0-18	Silt loam-----	CL	A-6	0	100	100	95-100	90-100	25-40	10-20
	18-40	Silty clay loam, silty clay.	CH, CL	A-7	0	100	100	95-100	90-100	45-70	25-40
	40-60	Silt loam, silty clay loam.	CL, CL-ML	A-6, A-4	0	100	100	95-100	90-100	25-40	5-20
45------------ Denny	0-9	Silt loam-----	CL	A-6, A-4	0	100	100	95-100	95-100	30-40	8-15
	9-17	Silt loam-----	CL-ML, CL	A-4, A-6	0	100	100	95-100	95-100	25-40	5-15
	17-34	Silty clay loam, silty clay.	CL, CH	A-7, A-6	0	100	100	95-100	95-100	35-60	15-35
	34-60	Silt loam, silty clay loam.	CL	A-6	0	100	100	95-100	95-100	25-40	11-20
54B, 54D------ Plainfield	0-5	Sand----------	SP-SM, SM, SP	A-3, A-2, A-1	0	75-100	75-100	40-80	3-35	---	NP
	5-60	Sand, fine sand.	SP, SM, SP-SM	A-3, A-1, A-2	0	75-100	75-100	40-90	1-15	---	NP
54F----------- Plainfield	0-4	Loamy sand----	SM, SP-SM	A-2, A-4, A-1	0	75-100	75-100	40-90	12-40	---	NP
	4-60	Sand, fine sand.	SP, SM, SP-SM	A-3, A-1, A-2	0	75-100	75-100	40-90	1-15	---	NP

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments >3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
61------------ Atterberry	0-8	Silt loam-----	CL-ML, CL	A-4, A-6	0	100	100	95-100	95-100	25-40	5-15
	8-11	Silt loam-----	CL, CL-ML	A-4, A-6	0	100	100	95-100	95-100	25-35	5-15
	11-39	Silt loam, silty clay loam.	CL, CH	A-6, A-7	0	100	100	95-100	95-100	35-55	15-30
	39-60	Silt loam, loam.	CL	A-6	0	100	100	95-100	95-100	30-40	10-20
67------------ Harpster	0-12	Silty clay loam.	CL, CH	A-7	0	100	95-100	95-100	90-100	45-60	20-35
	12-22	Silty clay loam.	CL, CH	A-7	0	100	95-100	95-100	85-100	40-60	20-35
	22-60	Silty clay loam, silt loam, loam.	CL, CH	A-6, A-7	0	100	95-100	95-100	70-100	35-55	20-35
68------------ Sable	0-8	Silty clay loam.	CL, CH, ML, MH	A-7	0	100	100	95-100	95-100	41-65	15-35
	8-15	Silty clay loam.	CL, CH, ML, MH	A-7	0	100	100	95-100	95-100	41-65	15-35
	15-44	Silty clay loam, silt loam.	CL, CH	A-7	0	100	100	95-100	95-100	40-55	20-35
	44-60	Silt loam, silty clay loam.	CL	A-6	0	100	100	95-100	95-100	30-40	10-20
88B, 88D------ Sparta	0-10	Loamy sand----	SM	A-2, A-4	0	85-100	85-100	50-95	15-50	---	NP
	10-60	Sand, fine sand.	SP-SM, SM, SP	A-2, A-3	0	85-100	85-100	50-95	2-30	---	NP
93D, 93F------ Rodman	0-8	Gravelly loam	ML, CL, SM, SC	A-4	0-2	70-85	65-75	60-75	36-65	<30	3-9
	8-14	Gravelly loam, sandy loam, loam.	ML, CL, SC, SM	A-4, A-2, A-1	0-2	70-85	60-85	40-75	20-55	<30	NP-10
	14-60	Stratified sand to extremely gravelly coarse sand.	SP, SP-SM, GP, GP-GM	A-1	1-5	30-70	22-50	7-20	2-10	---	NP
100----------- Palms	0-27	Sapric material.	PT	---	---	---	---	---	---	---	---
	27-60	Silt loam, loam, sandy loam, clay loam.	CL-ML, CL	A-4, A-6	0	85-100	80-100	70-95	50-90	25-40	5-20
102----------- La Hogue	0-22	Loam----------	ML, CL, CL-ML	A-4	0	100	95-100	80-100	50-80	20-35	3-10
	22-44	Sandy clay loam, silty clay loam, clay loam.	CL, SC	A-6, A-4	0	100	100	80-100	40-85	25-40	8-20
	44-51	Sandy loam, loamy sand, silt loam.	ML, CL, SM, SC	A-2, A-4, A-6	0	100	90-100	75-90	15-70	15-30	2-15
	51-60	Stratified sand to silt loam.	CL, ML, SC, SM	A-4, A-2	0	90-100	80-100	50-95	10-60	<25	NP-10

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments >3 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
103----------- Houghton	0-60	Sapric material.	PT	A-8	0	---	---	---	---	---	---
125----------- Selma	0-22	Loam----------	CL	A-4, A-6	0	100	95-100	80-100	55-85	25-35	7-17
	22-60	Sandy loam, loam, silty clay loam, silt loam.	CL, SC	A-6	0	100	95-100	80-95	38-85	24-36	11-19
131A, 131B---- Alvin	0-8	Loamy sand----	SM	A-2	0	100	100	50-75	15-30	<20	NP-4
	8-26	Very fine sandy loam, sandy loam, loam.	SM, SC, CL, ML	A-2, A-4, A-6	0	100	100	70-100	20-80	15-40	NP-15
	26-60	Very fine sand, fine sandy loam, loamy fine sand.	SP, SP-SM, SM	A-2, A-3, A-1	0	95-100	90-100	45-95	4-35	<20	NP-4
131D---------- Alvin	0-8	Fine sandy loam.	SM, ML	A-4, A-2	0	100	100	80-95	30-60	<25	NP-4
	8-25	Very fine sandy loam, sandy loam, loam.	SM, SC, CL, ML	A-2, A-4, A-6	0	100	100	70-100	20-80	15-40	NP-15
	25-60	Very fine sand, fine sandy loam, loamy fine sand.	SP, SP-SM, SM	A-2, A-3, A-1	0	95-100	90-100	45-95	4-35	<20	NP-4
134A---------- Camden	0-16	Silt loam-----	CL, ML, CL-ML	A-4, A-6	0	100	100	95-100	90-100	20-35	3-15
	16-30	Silt loam, silty clay loam.	CL	A-6	0	100	100	95-100	90-100	25-40	15-25
	30-51	Clay loam, sandy loam, silt loam.	ML, SC, SM, CL	A-2, A-4, A-6	0-5	90-100	85-100	60-100	30-70	20-40	3-15
	51-60	Stratified sandy loam to silt loam.	SM, SC, ML, CL	A-2, A-4	0-5	90-100	80-100	50-80	20-60	<25	3-10
134B---------- Camden	0-12	Silt loam-----	CL, ML, CL-ML	A-4, A-6	0	100	100	95-100	90-100	20-35	3-15
	12-30	Silt loam, silty clay loam.	CL	A-6	0	100	100	95-100	90-100	25-40	15-25
	30-58	Clay loam, sandy loam, silt loam.	ML, SC, SM, CL	A-2, A-4, A-6	0-5	90-100	85-100	60-100	30-70	20-40	3-15
	58-60	Stratified sandy loam to gravelly clay loam.	SM, SC, ML, CL	A-2, A-4	0-5	80-100	70-100	50-80	20-60	<25	3-10

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments >3 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
138----------- Shiloh	0-15	Silty clay loam.	CL	A-7	0	100	100	95-100	90-100	40-50	15-25
	15-42	Silty clay, silty clay loam.	CL, CH	A-7	0	100	100	95-100	90-100	40-65	15-40
	42-60	Silty clay loam, silty clay, silt loam.	CL	A-7, A-6	0	100	100	95-100	90-100	30-50	15-30
145C2--------- Saybrook	0-12	Silt loam-----	CL, CL-ML	A-6, A-4	0	100	100	95-100	90-100	25-40	5-20
	12-28	Silt loam, silty clay loam.	CL, CH	A-6, A-7	0	100	100	90-100	85-100	35-55	15-30
	28-32	Clay loam, loam, silt loam.	CL	A-6, A-4	0	95-100	85-100	80-95	60-85	20-40	8-25
	32-60	Loam, silt loam.	CL	A-6	0-5	95-100	85-100	80-95	60-85	20-40	10-25
148----------- Proctor	0-19	Silt loam-----	CL	A-6	0	100	100	95-100	85-100	25-40	10-20
	19-32	Silty clay loam.	CL	A-7, A-6	0	95-100	90-100	85-100	85-100	25-50	10-25
	32-48	Clay loam, sandy loam, loam.	CL, SC, CL-ML, SC-SM	A-6, A-7, A-4, A-2	0	90-100	85-100	75-100	30-80	20-45	5-25
	48-60	Stratified gravelly clay loam to sand.	SC, CL, SC-SM, CL-ML	A-2, A-4, A-6	0	85-100	80-100	50-100	25-80	20-40	5-20
150A, 150B---- Onarga	0-11	Sandy loam----	SC, SM, SC-SM	A-4, A-6, A-2	0	100	100	75-95	25-50	<28	NP-12
	11-29	Loam, sandy clay loam, fine sandy loam.	SC, CL, SC-SM, CL-ML	A-4, A-6, A-2-4, A-2-6	0	95-100	95-100	75-95	30-60	19-32	5-14
	29-60	Stratified sand to sandy loam.	SM, SP-SM, SC-SM	A-2, A-4	0	85-100	80-100	70-95	12-50	<20	NP-6
151----------- Ridgeville	0-18	Sandy loam----	SM, SC-SM	A-2, A-4	0	100	100	90-100	15-50	<25	NP-6
	18-36	Very fine sandy loam, sandy clay loam, loam.	SC-SM, SC, CL, CL-ML	A-4, A-6	0	95-100	95-100	75-95	35-60	20-35	5-15
	36-60	Loamy sand, sandy loam, fine sand.	SM, SC-SM, SC, SP-SM	A-2, A-4	0	90-100	90-100	70-100	10-50	<20	NP-8
152----------- Drummer	0-19	Silty clay loam.	CL	A-6, A-7	0	100	95-100	95-100	85-95	30-50	15-30
	19-41	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	95-100	95-100	85-95	30-50	15-30
	41-53	Loam, silt loam, clay loam.	CL	A-6, A-7	0-5	95-100	90-100	75-95	60-85	30-50	15-30
	53-60	Stratified loamy sand to silty clay loam.	SC, CL	A-4, A-6	0-5	95-100	85-95	75-95	45-80	20-35	7-20

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments >3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
171C2---------Catlin	0-7	Silt loam-----	ML, CL, CL-ML	A-6, A-7, A-4	0	100	100	95-100	85-100	25-45	5-20
	7-43	Silty clay loam, silt loam.	CL, ML	A-7, A-6	0	100	90-100	90-100	80-100	30-50	15-30
	43-60	Loam, clay loam, silt loam.	CL	A-6, A-7	0-3	90-100	90-100	85-100	60-100	25-45	10-20
198-----------Elburn	0-21	Silt loam-----	CL	A-6	0	100	100	95-100	90-100	25-40	10-25
	21-76	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	100	75-90	30-50	15-35
	76-84	Stratified silty clay loam to loam.	CL, CL-ML, SC, SC-SM	A-6, A-4, A-2	0	90-100	80-100	60-90	25-80	20-40	5-20
199A----------Plano	0-22	Silt loam-----	CL-ML, CL	A-4, A-6	0	100	100	95-100	95-100	20-30	5-15
	22-68	Silty clay loam, silt loam.	CL	A-6	0	100	100	95-100	95-100	25-40	10-25
	68-78	Clay loam, loam, sandy loam, silt loam.	CL, SC, CL-ML, SC-SM	A-6, A-7, A-4	0-1	90-100	85-95	60-90	40-75	20-45	5-25
199B----------Plano	0-13	Silt loam-----	CL-ML, CL	A-4, A-6	0	100	100	95-100	95-100	20-30	5-15
	13-45	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	95-100	95-100	25-45	10-25
	45-60	Stratified sandy loam to silt loam.	ML, SM, CL, SC	A-4, A-2	0-5	90-100	85-95	60-90	30-70	<25	NP-10
200-----------Orio	0-9	Fine sandy loam.	SM, SC, SC-SM	A-4, A-2-4	0	100	100	70-85	25-50	15-30	2-10
	9-21	Loam, fine sandy loam, loamy fine sand.	SM, SC, ML, CL	A-4, A-2-4	0	100	100	75-90	15-60	<35	2-10
	21-35	Loam, sandy clay loam, clay loam.	CL, SC	A-6, A-7	0	100	100	80-95	35-75	30-45	10-20
	35-49	Sandy clay loam, sandy loam, loamy sand.	SC-SM, SC	A-4, A-2-4, A-6, A-2-6	0	100	100	75-90	15-45	25-35	5-15
	49-60	Loamy sand, sand, loamy fine sand.	SM, SC, SP-SM, SC-SM	A-2-4, A-3	0	100	100	60-90	5-35	20-30	NP-10
201-----------Gilford	0-15	Sandy loam----	SM, SC, SC-SM	A-4, A-2-4	0	95-100	95-100	60-80	30-45	<25	2-10
	15-27	Sandy loam, fine sandy loam.	SM, SC, SC-SM	A-2-4	0	95-100	95-100	55-70	20-35	15-30	NP-8
	27-36	Loamy sand, sand, loamy fine sand.	SM, SP, SP-SM	A-3, A-1-b, A-2-4	0	95-100	95-100	15-60	3-20	---	NP
	36-60	Sand, coarse sand, loamy sand.	SP, SP-SM, SM	A-1-b, A-2-4, A-3	0	95-100	95-100	15-60	3-20	---	NP

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments >3 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
221C2--------- Parr	0-8	Silt loam-----	CL, CL-ML	A-4, A-6	0	95-100	95-100	80-100	50-90	15-30	4-15
	8-26	Clay loam, loam, silty clay loam.	CL	A-6, A-4	0	90-100	90-100	75-100	50-95	25-35	9-15
	26-60	Loam, silt loam.	CL, ML, CL-ML	A-4	0-3	85-95	85-95	75-85	50-65	<25	3-8
224E---------- Strawn	0-7	Loam----------	CL, ML, CL-ML	A-4, A-6	0	95-100	95-100	90-100	90-100	20-40	3-20
	7-22	Silty clay loam, clay loam.	CL	A-6, A-7	0-5	90-100	80-100	75-95	50-95	25-45	10-23
	22-60	Loam, silt loam, clay loam.	CL, SC	A-4, A-6	0-5	75-100	70-100	60-95	40-95	20-35	7-18
233C2--------- Birkbeck	0-7	Silt loam-----	ML	A-4, A-6, A-7	0	100	100	95-100	95-100	28-45	5-15
	7-44	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	95-100	95-100	85-100	30-50	10-25
	44-47	Loam, silt loam, clay loam.	CL, CL-ML	A-4, A-6	0-5	95-100	85-100	70-100	55-80	25-40	5-20
	47-60	Loam, silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0-5	95-100	85-100	70-100	55-80	20-40	5-20
233C3--------- Birkbeck	0-8	Silty clay loam.	ML	A-6, A-7	0	100	100	95-100	85-100	35-50	10-20
	8-44	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	95-100	95-100	85-100	30-50	10-25
	44-60	Loam, silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0-5	95-100	85-100	70-100	55-80	20-40	5-20
233D2--------- Birkbeck	0-6	Silt loam-----	ML	A-4, A-6, A-7	0	100	100	95-100	95-100	28-45	5-15
	6-45	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	95-100	95-100	85-100	30-50	10-25
	45-58	Loam, silty clay loam, clay loam.	CL, CL-ML	A-4, A-6	0-5	95-100	85-100	70-100	55-80	25-40	5-20
	58-60	Loam, silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0-5	95-100	85-100	70-100	55-80	20-40	5-20
243A, 243B, 243C2-------- St. Charles	0-10	Silt loam-----	CL	A-4, A-6	0	100	100	95-100	95-100	22-35	7-15
	10-48	Silty clay loam, silt loam.	CL	A-6	0	100	100	95-100	90-100	30-40	10-20
	48-55	Clay loam, loam, sandy loam.	CL, SC	A-4, A-6	0	90-100	75-100	75-95	40-80	20-35	8-20
	55-60	Stratified gravelly sandy loam to silt loam.	SC, CL, CL-ML, SC-SM	A-2, A-4, A-6	0-5	90-100	70-90	60-90	30-70	15-35	5-15

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments >3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
266A---------- Disco	0-26	Sandy loam----	SM, SC, SC-SM	A-2, A-4	0	100	95-100	80-95	30-50	15-28	NP-10
	26-41	Sandy loam, loamy sand.	SM, SC, SC-SM	A-2, A-4	0	100	95-100	70-90	15-50	5-20	NP-10
	41-60	Loamy sand, sand.	SM, SP, SC, SC-SM	A-2, A-3	0	100	95-100	70-90	3-20	5-20	NP-10
272----------- Edgington	0-15	Silt loam-----	CL	A-6, A-4	0	100	100	95-100	90-100	30-40	9-17
	15-28	Silt loam-----	CL	A-6, A-4	0	100	100	95-100	90-100	25-40	7-16
	28-56	Silty clay loam.	CL	A-7, A-6	0	100	100	95-100	90-100	35-50	15-25
	56-60	Silt loam-----	CL	A-6	0	100	100	95-100	90-100	25-40	10-20
278----------- Stronghurst	0-7	Silt loam-----	CL, CL-ML	A-4, A-6	0	100	100	95-100	95-100	25-35	5-15
	7-12	Silt loam-----	CL, CL-ML	A-4, A-6	0	100	100	95-100	95-100	25-35	5-15
	12-40	Silty clay loam, silt loam.	CL, CH	A-7	0	100	100	100	98-100	40-55	20-35
	40-60	Silt loam-----	CL, CL-ML	A-6, A-4	0	100	100	95-100	95-100	25-40	5-20
279B2--------- Rozetta	0-7	Silt loam-----	CL	A-4, A-6	0	100	100	95-100	95-100	24-35	8-15
	7-44	Silty clay loam.	CL	A-7, A-6	0	100	100	95-100	95-100	35-50	15-30
	44-60	Silt loam-----	CL	A-6, A-4	0	100	100	95-100	85-100	25-40	7-20
280C2--------- Fayette	0-7	Silt loam-----	CL	A-6, A-7	0	100	100	100	95-100	30-45	10-25
	7-57	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	100	95-100	35-45	15-25
	57-60	Silt loam-----	CL	A-6	0	100	100	100	95-100	30-40	10-20
290A---------- Warsaw	0-22	Loam----------	CL, CL-ML	A-4, A-6	0	85-100	85-100	70-100	50-90	20-30	4-12
	22-38	Gravelly sandy clay loam, gravelly clay loam, gravelly sandy loam.	CL, SC, GC, SC-SM	A-6, A-2-6, A-4, A-2-4	0-5	70-90	60-85	55-70	30-60	20-35	6-15
	38-60	Stratified sand to very gravelly coarse sand.	SP, GP, SP-SM, GP-GM	A-1	1-5	30-70	22-55	7-20	2-10	<20	NP
290B---------- Warsaw	0-17	Loam----------	CL, CL-ML	A-4, A-6	0	85-100	85-100	70-100	50-90	20-30	4-12
	17-33	Sandy clay loam, loam, clay loam.	SC, CL, CL-ML, SC-SM	A-6, A-2-6, A-4, A-2-4	0-3	90-100	85-100	60-90	30-70	20-35	6-15
	33-60	Stratified sand to very gravelly coarse sand.	SP, GP, SP-SM, GP-GM	A-1	1-5	30-70	22-55	7-20	2-10	<20	NP
323C3--------- Casco	0-4	Clay loam-----	CL	A-6	0-5	95-100	95-100	90-100	50-80	30-40	10-20
	4-22	Clay loam, sandy clay loam, gravelly loam.	SC, CL, GC	A-6, A-7, A-2	0-5	60-100	55-100	45-100	20-80	25-46	11-26
	22-60	Stratified sand to gravel.	GP, SP, GP-GM, SP-SM	A-1, A-2, A-3	0-10	30-100	30-100	10-95	2-10	---	NP

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag-ments >3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct					Pct	
329----------- Will	0-20	Loam----------	CL	A-7, A-6	0	95-100	95-100	90-100	60-90	35-50	15-25
	20-26	Loam, clay loam, silty clay loam.	CL, CH	A-7	0-5	90-100	90-100	80-100	60-90	40-60	20-35
	26-60	Stratified sand to gravelly loamy sand.	GP, GP-GM, SP, SP-SM	A-1	1-10	40-80	40-70	40-50	0-10	---	NP
347----------- Canisteo	0-17	Loam----------	CL	A-7, A-6	0	95-100	95-100	85-100	60-100	30-50	10-25
	17-41	Clay loam, loam, silty clay loam.	CL	A-6, A-7	0	98-100	90-100	85-95	65-85	38-50	25-35
	41-60	Stratified silt loam to sandy loam.	CL, ML, SM, SC	A-6, A-4	0-5	90-100	80-95	60-90	40-80	30-40	5-15
379A, 379B---- Dakota	0-15	Loam----------	CL	A-4, A-6	0	95-100	85-100	75-95	50-75	25-35	7-15
	15-31	Loam, sandy clay loam, clay loam.	CL, SC	A-4, A-6	0	95-100	85-100	70-100	35-80	25-40	9-20
	31-60	Loamy sand, coarse sand, loamy coarse sand.	SP, GP, GM, SM	A-1, A-3, A-2	0-5	50-100	45-100	20-75	2-30	---	NP
386B---------- Downs	0-12	Silt loam-----	CL, CL-ML	A-4, A-6	0	100	100	100	95-100	25-35	5-15
	12-50	Silty clay loam, silt loam.	CL	A-7, A-6	0	100	100	100	95-100	35-45	15-25
	50-60	Silt loam-----	CL	A-6	0	100	100	100	95-100	30-40	11-20
387A---------- Ockley	0-18	Sandy loam, fine sandy loam.	SM, SC-SM	A-2, A-4, A-1	0	95-100	85-100	45-80	20-50	<25	2-7
	18-36	Silty clay loam, clay loam, silt loam.	CL	A-6, A-4	0	90-100	80-100	70-90	55-90	25-40	8-15
	36-50	Gravelly clay loam, gravelly sandy clay loam.	CL, SC	A-6, A-4, A-2	0-2	70-85	45-85	40-70	25-55	25-40	8-15
	50-60	Stratified loamy sand to gravelly coarse sand.	SP, SP-SM, GP, GP-GM	A-1	1-5	30-70	20-55	10-40	2-10	---	NP
439----------- Jasper	0-15	Loam----------	CL-ML, CL	A-4, A-6	0	100	100	90-100	70-90	25-35	5-15
	15-46	Loam, clay loam, sandy clay loam.	CL-ML, CL, SC-SM, SC	A-4, A-6	0	100	100	60-100	35-85	20-35	5-20
	46-60	Loamy sand, sand.	SM, SP-SM, SC, SC-SM	A-2-4, A-3	0	100	100	50-75	5-30	<25	NP-10
447----------- Canisteo	0-14	Loam----------	CL	A-4, A-6	0	100	95-100	80-100	55-85	25-35	7-17
	14-48	Clay loam, loam, silt loam, sandy loam.	CL	A-6, A-7	0	95-100	90-100	85-95	65-85	30-45	10-20
	48-60	Loamy sand, sand.	SM, SP-SM	A-2, A-3	0	95-100	90-100	50-75	5-25	---	NP

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments >3 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
533*. Urban land											
684B---------- Broadwell	0-13	Silt loam-----	ML, CL	A-6, A-7, A-4	0	100	100	90-100	85-100	30-45	5-20
	13-42	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	95-100	90-100	30-45	10-25
	42-60	Loamy fine sand, fine sand, sand.	SM, SP-SM, SP, SC-SM	A-3, A-2	0	100	100	75-95	4-35	<20	NP-5
684C2--------- Broadwell	0-8	Silt loam-----	ML, CL	A-6, A-7, A-4	0	100	100	90-100	85-100	30-45	5-20
	8-46	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	95-100	90-100	30-45	10-25
	46-60	Loamy fine sand, fine sand, sand.	SM, SP-SM, SP, SC-SM	A-3, A-2	0	100	100	75-95	4-35	<20	NP-5
689B---------- Coloma	0-6	Sand----------	SP, SM, SP-SM	A-2, A-3	0-7	75-100	75-100	50-70	2-15	---	NP
	6-40	Sand, loamy sand.	SP, SM, SP-SM	A-2, A-3	0-7	75-100	75-100	50-75	2-30	---	NP
	40-60	Stratified sand to sandy loam.	SP, SM, SP-SM	A-2, A-3, A-4	0-7	75-100	75-100	50-100	2-40	---	NP
802*---------- Orthents	0-60	Loam----------	---	---	---	---	---	---	---	---	NP-15
	60-80	Variable------	---	---	---	---	---	---	---	---	---
865*. Pits											
935F*: Miami--------	0-6	Silt loam-----	CL, CL-ML, ML	A-4	0	100	95-100	80-100	50-90	15-30	3-10
	6-31	Clay loam, loam, silty clay loam, silt loam.	CL, SC	A-6	0	90-100	85-100	70-95	40-95	30-40	15-25
	31-36	Loam, silt loam.	CL, SC	A-4, A-6	0-3	85-100	85-100	70-90	40-90	25-35	8-15
	36-60	Loam, silt loam.	CL, CL-ML, SC, SC-SM	A-4, A-6	0-3	85-100	85-100	70-90	45-70	20-40	5-20
Hennepin-----	0-6	Loam----------	CL, CL-ML	A-4, A-6, A-7	0-5	90-100	85-100	70-100	60-95	25-45	5-20
	6-15	Loam, clay loam, silt loam.	SC, SC-SM, CL, CL-ML	A-4, A-6, A-7	0-5	85-100	75-100	65-100	35-95	20-50	5-25
	15-60	Loam, clay loam, silt loam.	SC, SC-SM, CL, CL-ML	A-4, A-6, A-7	0-5	85-100	75-100	65-100	35-95	20-50	5-25

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments >3 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
935G*:											
Miami	0-4	Loam	CL, CL-ML, ML	A-4	0	100	95-100	80-100	50-90	15-30	3-10
	4-31	Clay loam, loam, silty clay loam, silt loam.	CL, SC	A-6	0	90-100	85-100	70-95	40-95	30-40	15-25
	31-36	Loam, silt loam.	CL, SC	A-4, A-6	0-3	85-100	85-100	70-90	40-90	25-35	8-15
	36-60	Loam, silt loam.	CL, CL-ML, SC, SC-SM	A-4, A-6	0-3	85-100	85-100	70-90	45-70	20-40	5-20
Hennepin	0-5	Loam	CL, CL-ML	A-4, A-6, A-7	0-5	90-100	85-100	70-100	60-95	25-45	5-20
	5-16	Loam, clay loam, silt loam.	SC, SC-SM, CL, CL-ML	A-4, A-6, A-7	0-5	85-100	75-100	65-100	35-95	20-50	5-25
	16-60	Loam, clay loam, silt loam.	SC, SC-SM, CL, CL-ML	A-4, A-6, A-7	0-5	85-100	75-100	65-100	35-95	20-50	5-25
2043*:											
Ipava	0-11	Silt loam	CL	A-6	0	100	100	95-100	90-100	25-40	10-20
	11-38	Silty clay loam, silt loam.	CH, CL	A-7	0	100	100	95-100	90-100	45-70	25-40
	38-60	Silt loam, silty clay loam.	CL, CL-ML	A-6, A-4	0	100	100	95-100	90-100	25-40	5-20
Urban land.											
2068*:											
Sable	0-6	Silty clay loam.	CL, CH, ML, MH	A-7	0	100	100	95-100	95-100	41-65	15-35
	6-21	Silty clay loam.	CL, CH, ML, MH	A-7	0	100	100	95-100	95-100	41-65	15-35
	21-53	Silty clay loam, silt loam.	CL, CH	A-7	0	100	100	95-100	95-100	40-55	20-35
	53-60	Silt loam, silty clay loam.	CL	A-6	0	100	100	95-100	95-100	30-40	10-20
Urban land.											
2088B*:											
Sparta	0-11	Sandy loam	SM	A-2, A-4	0	85-100	85-100	50-95	15-50	---	NP
	11-20	Loamy sand, fine sand, sand.	SP-SM, SM	A-2, A-3, A-4	0	85-100	85-100	50-95	5-50	---	NP
	20-60	Sand, fine sand.	SP-SM, SM, SP	A-2, A-3	0	85-100	85-100	50-95	2-30	---	NP
Urban land.											

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments >3 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
2266B*:											
Disco----------	0-23	Loam, sandy loam.	SM, SC, SC-SM	A-2, A-4	0	100	95-100	80-95	30-50	15-28	NP-10
	23-45	Sandy loam, loamy sand.	SM, SC, SC-SM	A-2, A-4	0	100	95-100	70-90	15-50	5-20	NP-10
	45-60	Loamy sand, sand, sandy loam.	SM, SP, SC, SC-SM	A-2, A-3	0	100	95-100	70-90	3-20	5-20	NP-10
Urban land.											
2278*:											
Stronghurst--	0-7	Silt loam-----	CL, CL-ML	A-4, A-6	0	100	100	95-100	95-100	25-35	5-15
	7-50	Silty clay loam, silt loam.	CL, CH	A-7	0	100	100	100	98-100	40-55	20-35
	50-60	Silt loam-----	CL, CL-ML	A-6, A-4	0	100	100	95-100	95-100	25-40	5-20
Urban land.											
2279B*:											
Rozetta------	0-12	Silt loam-----	CL	A-4, A-6	0	100	100	95-100	95-100	24-35	8-15
	12-56	Silty clay loam.	CL	A-7, A-6	0	100	100	95-100	95-100	35-50	15-30
	56-60	Silt loam-----	CL	A-6, A-4	0	100	100	95-100	85-100	25-40	7-20
Urban land.											
3028---------- Jules	0-12	Silt loam-----	ML	A-4	0	100	100	90-100	80-100	25-35	4-10
	12-60	Silt loam, loam.	ML, CL-ML	A-4	0	100	100	90-100	80-100	25-35	4-10
3073---------- Ross	0-13	Silt loam-----	ML, CL-ML, CL	A-4, A-6	0	90-100	90-100	80-100	65-95	20-35	NP-12
	13-43	Loam, silt loam, clay loam.	ML, CL, CL-ML	A-6, A-4, A-7	0	90-100	85-100	70-100	55-95	22-45	3-20
	43-60	Stratified sandy loam to silt loam.	CL, ML, SM, GM	A-6, A-4, A-2	0-5	65-100	45-100	30-100	25-80	<30	NP-12
3074---------- Radford	0-19	Silt loam-----	ML, CL	A-4, A-6	0	100	100	95-100	80-100	30-40	5-15
	19-26	Silt loam-----	CL, ML	A-4, A-6	0	100	100	95-100	80-100	25-35	5-15
	26-60	Silt loam, silty clay loam, clay loam.	CL	A-6, A-7	0	100	100	95-100	80-95	35-50	15-25
3077---------- Huntsville	0-24	Silt loam-----	CL	A-6	0	100	95-100	90-100	85-100	25-40	10-20
	24-60	Silt loam-----	CL	A-6	0	100	95-100	90-100	85-100	20-35	10-20
3107---------- Sawmill	0-27	Silty clay loam.	CL	A-6, A-7	0	100	100	95-100	85-100	30-50	15-30
	27-52	Silty clay loam, clay loam, loam.	CL	A-6, A-7, A-4	0	100	100	85-100	70-95	25-50	8-25
	52-60	Silty clay loam, loam, silt loam.	CL	A-4, A-6, A-7	0	100	100	75-100	65-95	20-50	8-30

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments >3 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
3304---------- Landes	0-21	Fine sandy loam.	SM, SC, SC-SM	A-4, A-2-4	0	100	70-100	70-95	20-50	<25	NP-10
	21-39	Loam, fine sandy loam, loamy fine sand.	SM, CL-ML, SC, SC-SM	A-4, A-2-4	0	100	85-100	70-100	15-60	<25	NP-10
	39-60	Stratified sand to silt loam.	SM, SP-SM, SC, SC-SM	A-4, A-2-4	0	100	85-100	70-85	10-50	<30	NP-10
3451---------- Lawson	0-11	Silt loam-----	CL, CL-ML	A-4, A-6	0	100	100	90-100	85-100	20-40	5-20
	11-32	Silt loam, silty clay loam.	CL, CL-ML	A-4	0	100	100	90-100	85-100	20-30	5-10
	32-40	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	90-100	60-100	20-45	10-25
	40-60	Stratified silty clay loam to sandy loam.	CL-ML, CL, SC-SM, SC	A-4, A-6	0	100	100	60-100	35-85	20-35	5-20
7070---------- Beaucoup	0-11	Silty clay loam.	CL	A-6, A-7	0	100	100	90-100	85-100	30-45	15-25
	11-60	Silty clay loam.	CL	A-6, A-7	0	100	100	90-100	85-100	30-45	15-30
7302---------- Ambraw	0-10	Loam----------	CL	A-6, A-7	0	100	100	85-95	70-95	30-45	10-20
	10-39	Clay loam, clay, silty clay loam.	CL, CH	A-6, A-7	0	100	100	80-90	60-80	35-55	15-30
	39-52	Clay loam, loam.	CL	A-7, A-6	0	100	90-100	85-95	50-85	30-50	10-25
	52-60	Stratified silty clay loam to sandy loam.	SC, ML, CL, SM	A-6, A-4	0	100	90-100	80-90	40-80	20-40	NP-17
7404---------- Titus	0-11	Silty clay----	CH, CL	A-7	0	100	100	95-100	90-100	40-55	20-30
	11-60	Silty clay loam, silty clay.	CH, CL	A-7	0	100	100	95-100	90-100	40-55	20-30
8028---------- Jules	0-10	Silt loam-----	ML	A-4	0	100	100	90-100	80-100	25-35	4-10
	10-60	Silt loam, silt.	ML, CL-ML	A-4	0	100	100	90-100	80-100	25-35	4-10
8284---------- Tice	0-7	Silt loam-----	CL	A-6, A-7	0	100	100	90-100	80-95	30-45	10-20
	7-50	Silty clay loam, silt loam.	CL, CH	A-7	0	100	100	95-100	85-95	40-55	15-30
	50-60	Stratified silty clay loam to loam.	CL-ML, CL	A-4, A-6, A-7	0	100	100	60-95	55-80	25-45	5-20

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

(The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated)

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodibility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
19C2, 19D2	0-7	20-27	1.20-1.40	0.6-2.0	0.20-0.22	5.6-7.3	Low	0.37	5	6	1-2
Sylvan	7-33	25-35	1.30-1.50	0.6-2.0	0.18-0.20	5.6-7.3	Moderate	0.37			
	33-60	10-27	1.30-1.50	0.6-2.0	0.20-0.22	6.6-8.4	Low	0.37			
27C2, 27D2	0-7	11-22	1.30-1.45	0.6-2.0	0.20-0.24	5.6-7.3	Low	0.37	4	5	.5-3
Miami	7-27	27-35	1.45-1.65	0.6-2.0	0.15-0.20	5.1-7.3	Moderate	0.37			
	27-60	20-30	1.50-1.70	0.2-0.6	0.14-0.19	6.6-7.8	Low	0.37			
36B	0-12	20-26	1.25-1.30	0.6-2.0	0.22-0.24	5.1-7.3	Moderate	0.28	5	6	3-4
Tama	12-44	27-35	1.30-1.35	0.6-2.0	0.18-0.20	5.1-6.5	Moderate	0.43			
	44-60	20-30	1.35-1.40	0.6-2.0	0.18-0.20	5.6-7.3	Moderate	0.43			
36C2	0-9	24-27	1.25-1.30	0.6-2.0	0.22-0.24	5.1-7.3	Moderate	0.32	5	6	2-3
Tama	9-44	27-32	1.25-1.30	0.6-2.0	0.22-0.24	5.1-7.3	Moderate	0.32			
	44-52	27-35	1.30-1.35	0.6-2.0	0.18-0.20	5.1-6.5	Moderate	0.43			
	52-60	22-28	1.35-1.40	0.6-2.0	0.18-0.20	5.6-7.3	Moderate	0.43			
43	0-18	20-27	1.15-1.35	0.6-2.0	0.22-0.24	5.6-7.3	Moderate	0.28	5	6	4-5
Ipava	18-40	35-43	1.25-1.50	0.2-0.6	0.11-0.20	5.6-7.8	High	0.43			
	40-60	20-30	1.30-1.55	0.2-0.6	0.20-0.22	6.1-8.4	Moderate	0.43			
45	0-9	20-27	1.25-1.45	0.6-2.0	0.22-0.24	5.6-7.3	Low	0.37	3	6	3-4
Denny	9-17	15-22	1.25-1.45	0.2-0.6	0.18-0.20	5.6-6.5	Low	0.37			
	17-34	35-45	1.20-1.40	0.06-0.2	0.11-0.22	5.6-6.5	High	0.37			
	34-60	25-35	1.40-1.60	0.2-0.6	0.20-0.22	5.6-7.8	Moderate	0.37			
54B, 54D	0-5	2-5	1.50-1.65	6.0-20	0.04-0.09	4.5-7.3	Low	0.15	5	1	<1
Plainfield	5-60	0-4	1.50-1.70	6.0-20	0.04-0.07	4.5-7.3	Low	0.17			
54F	0-4	3-7	1.50-1.65	2.0-6.0	0.09-0.12	4.5-7.3	Low	0.17	5	2	<1
Plainfield	4-60	0-4	1.50-1.70	6.0-20	0.04-0.07	4.5-6.5	Low	0.17			
61	0-8	15-26	1.35-1.55	0.6-2.0	0.22-0.25	5.6-7.3	Low	0.32	5	6	2-4
Atterberry	8-11	15-26	1.40-1.60	0.6-2.0	0.21-0.24	5.1-7.3	Low	0.32			
	11-39	20-35	1.40-1.60	0.6-2.0	0.14-0.24	5.1-7.3	Moderate	0.43			
	39-60	18-27	1.40-1.65	0.6-2.0	0.14-0.24	5.6-7.8	Low	0.43			
67	0-12	27-35	1.05-1.25	0.6-2.0	0.21-0.24	7.4-8.4	Moderate	0.28	5	4L	5-6
Harpster	12-22	27-35	1.20-1.50	0.6-2.0	0.18-0.22	7.4-8.4	Moderate	0.28			
	22-60	22-35	1.25-1.55	0.6-2.0	0.17-0.22	7.4-8.4	Moderate	0.28			
68	0-8	27-35	1.15-1.35	0.6-2.0	0.21-0.23	5.6-7.3	Moderate	0.28	5	7	5-6
Sable	8-15	27-35	1.20-1.40	0.6-2.0	0.18-0.20	5.6-7.3	Moderate	0.28			
	15-44	24-35	1.30-1.50	0.6-2.0	0.18-0.20	5.6-7.8	Moderate	0.28			
	44-60	20-28	1.30-1.50	0.6-2.0	0.20-0.22	6.6-8.4	Low	0.28			
88B, 88D	0-10	3-10	1.20-1.40	2.0-6.0	0.09-0.12	5.1-7.3	Low	0.17	5	2	1-2
Sparta	10-60	1-8	1.50-1.70	6.0-20	0.04-0.07	5.1-7.8	Low	0.17			
93D, 93F	0-8	8-25	1.20-1.50	2.0-0.6	0.10-0.12	6.6-7.8	Low	0.20	3	8	2-4
Rodman	8-14	5-25	1.10-1.50	2.0-0.6	0.09-0.12	6.6-7.8	Low	0.20			
	14-60	0-10	1.60-1.70	>20	0.02-0.04	7.4-8.4	Low	0.10			
100	0-27	---	0.25-0.45	0.2-0.6	0.35-0.45	5.1-7.8	-------------	----	5	2	>75
Palms	27-60	7-35	1.45-1.75	0.2-0.6	0.14-0.22	6.1-8.4	Low	0.37			

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodi-bility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
102-------------- La Hogue	0-22	10-27	1.40-1.60	0.6-2.0	0.20-0.24	6.1-7.3	Low----------	0.28	5	5	3-4
	22-44	18-35	1.50-1.70	0.6-2.0	0.12-0.20	5.1-7.3	Moderate-----	0.28			
	44-51	10-20	1.55-1.75	0.6-6.0	0.08-0.20	5.6-7.3	Low----------	0.20			
	51-60	5-20	1.60-1.80	2.0-6.0	0.05-0.22	5.6-7.8	Low----------	0.20			
103-------------- Houghton	0-60	---	0.15-0.45	0.6-2.0	0.35-0.45	5.6-7.8	-------------	----	5	2	>70
125-------------- Selma	0-22	20-27	1.40-1.60	0.6-2.0	0.20-0.24	5.1-7.8	Low----------	0.28	5	6	4-6
	22-60	18-30	1.40-1.60	0.6-2.0	0.15-0.19	6.1-8.4	Moderate-----	0.28			
131A, 131B------- Alvin	0-8	5-10	1.45-1.65	6.0-20	0.09-0.12	4.5-7.3	Low----------	0.17	5	2	.5-1
	8-26	15-18	1.40-1.65	2.0-6.0	0.14-0.18	4.5-7.3	Low----------	0.24			
	26-60	3-10	1.45-1.65	2.0-6.0	0.10-0.15	5.1-8.4	Low----------	0.24			
131D------------- Alvin	0-8	10-15	1.45-1.65	2.0-6.0	0.14-0.17	4.5-7.3	Low----------	0.24	5	3	.5-1
	8-25	15-18	1.40-1.65	2.0-6.0	0.14-0.18	4.5-7.3	Low----------	0.24			
	25-60	3-10	1.45-1.65	2.0-6.0	0.10-0.15	5.1-8.4	Low----------	0.24			
134A------------- Camden	0-16	14-27	1.35-1.55	0.6-2.0	0.21-0.25	5.1-7.3	Low----------	0.37	5	6	1-2
	16-30	22-35	1.40-1.60	0.6-2.0	0.14-0.24	5.1-7.3	Moderate-----	0.37			
	30-51	18-30	1.45-1.65	0.6-2.0	0.11-0.22	5.1-7.3	Low----------	0.32			
	51-60	5-30	1.40-1.70	0.6-6.0	0.12-0.22	5.6-8.4	Low----------	0.32			
134B------------- Camden	0-12	14-27	1.35-1.55	0.6-2.0	0.21-0.25	5.1-7.3	Low----------	0.37	5	6	1-2
	12-30	22-35	1.40-1.60	0.6-2.0	0.14-0.24	5.1-7.3	Moderate-----	0.37			
	30-58	18-30	1.45-1.65	0.6-2.0	0.11-0.22	5.1-7.3	Low----------	0.32			
	58-60	5-30	1.40-1.70	0.6-6.0	0.12-0.22	5.6-8.4	Low----------	0.32			
138-------------- Shiloh	0-15	35-40	1.30-1.50	0.2-0.6	0.18-0.21	6.1-7.3	High---------	0.28	5	7	4-6
	15-42	35-45	1.35-1.55	0.2-0.6	0.09-0.18	6.1-7.8	High---------	0.28			
	42-60	25-45	1.30-1.50	0.2-0.6	0.18-0.20	6.1-8.4	High---------	0.28			
145C2------------ Saybrook	0-12	20-26	1.10-1.30	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.32	5	6	3-4
	12-28	24-35	1.20-1.40	0.6-2.0	0.18-0.20	5.6-7.3	Moderate-----	0.43			
	28-32	24-35	1.50-1.60	0.6-2.0	0.15-0.21	6.1-7.8	Low----------	0.32			
	32-60	20-27	1.55-1.75	0.2-0.6	0.10-0.14	7.4-8.4	Low----------	0.37			
148-------------- Proctor	0-19	18-27	1.10-1.30	0.6-2.0	0.22-0.24	5.1-7.8	Low----------	0.32	5	6	2-4
	19-32	25-35	1.20-1.45	0.6-2.0	0.18-0.20	5.6-7.3	Moderate-----	0.43			
	32-48	22-35	1.30-1.55	0.6-6.0	0.13-0.16	5.6-7.3	Moderate-----	0.32			
	48-60	10-20	1.40-1.70	0.6-6.0	0.07-0.19	6.1-7.8	Low----------	0.17			
150A, 150B------- Onarga	0-18	8-15	1.15-1.45	0.6-6.0	0.13-0.22	5.6-7.8	Low----------	0.20	4	3	2-4
	18-36	15-18	1.45-1.70	0.6-6.0	0.15-0.19	4.5-7.3	Low----------	0.20			
	36-60	2-10	1.65-1.90	6.0-20	0.05-0.13	5.1-7.3	Low----------	0.15			
151-------------- Ridgeville	0-18	10-15	1.15-1.45	0.6-2.0	0.15-0.18	5.6-6.5	Low----------	0.20	5	3	2-4
	18-36	14-18	1.45-1.70	0.6-2.0	0.15-0.19	5.6-6.5	Low----------	0.20			
	36-60	3-10	1.55-1.90	2.0-6.0	0.09-0.13	6.6-7.8	Low----------	0.20			
152-------------- Drummer	0-19	27-35	1.10-1.30	0.6-2.0	0.21-0.23	5.6-7.8	Moderate-----	0.28	5	7	5-7
	19-41	20-35	1.20-1.45	0.6-2.0	0.21-0.24	5.6-7.8	Moderate-----	0.28			
	41-53	22-33	1.30-1.55	0.6-2.0	0.17-0.20	6.1-8.4	Moderate-----	0.28			
	53-60	15-32	1.40-1.70	0.6-2.0	0.11-0.19	6.6-8.4	Low----------	0.28			
171C2------------ Catlin	0-7	18-27	1.25-1.45	0.6-2.0	0.23-0.26	5.1-7.3	Low----------	0.32	5	6	3-4
	7-43	24-35	1.25-1.55	0.6-2.0	0.18-0.20	5.1-7.3	Moderate-----	0.43			
	43-60	20-30	1.40-1.70	0.6-2.0	0.07-0.11	6.1-8.4	Low----------	0.43			
198-------------- Elburn	0-21	22-27	1.10-1.30	0.6-2.0	0.22-0.24	5.6-7.8	Low----------	0.28	5	6	4-5
	21-76	25-35	1.20-1.40	0.6-2.0	0.18-0.20	5.6-7.8	Moderate-----	0.43			
	76-84	15-25	1.50-1.70	0.6-6.0	0.12-0.18	6.1-8.4	Low----------	0.43			

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodi-bility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
199A------------- Plano	0-22	18-27	1.10-1.30	0.6-2.0	0.22-0.24	6.1-7.3	Low-----------	0.32	5	6	3-5
	22-68	25-35	1.20-1.40	0.6-2.0	0.18-0.20	5.1-7.3	Moderate-----	0.43			
	68-78	15-32	1.30-1.55	0.6-6.0	0.09-0.16	5.6-7.3	Low-----------	0.37			
199B------------- Plano	0-13	18-27	1.10-1.30	0.6-2.0	0.22-0.24	6.1-7.3	Low-----------	0.32	5	6	3-5
	13-45	25-35	1.20-1.40	0.6-2.0	0.18-0.20	5.1-7.3	Moderate-----	0.43			
	45-60	10-20	1.50-1.70	0.6-2.0	0.11-0.22	5.6-8.4	Low-----------	0.37			
200-------------- Orio	0-9	8-18	1.30-1.50	2.0-6.0	0.13-0.15	4.5-7.8	Low-----------	0.20	5	3	1-2
	9-21	6-20	1.30-1.50	0.6-2.0	0.09-0.18	4.5-7.8	Low-----------	0.28			
	21-35	18-30	1.40-1.60	0.2-0.6	0.12-0.19	4.5-7.8	Moderate-----	0.28			
	35-49	10-22	1.50-1.70	0.6-2.0	0.09-0.17	4.5-7.8	Low-----------	0.28			
	49-60	3-10	1.55-1.75	6.0-20	0.05-0.13	4.5-7.8	Low-----------	0.28			
201-------------- Gilford	0-15	10-20	1.50-1.70	2.0-6.0	0.16-0.18	5.6-7.3	Low-----------	0.20	4	3	2-4
	15-27	8-17	1.60-1.80	2.0-6.0	0.12-0.14	5.6-7.3	Low-----------	0.20			
	27-36	3-12	1.70-1.90	6.0-20	0.05-0.08	6.1-7.3	Low-----------	0.15			
	36-60	2-10	1.70-1.90	6.0-20	0.05-0.08	6.6-8.4	Low-----------	0.15			
221C2------------ Parr	0-8	12-22	1.30-1.45	0.6-2.0	0.20-0.24	5.6-7.3	Low-----------	0.32	4	5	2-4
	8-26	22-32	1.40-1.55	0.6-2.0	0.15-0.19	5.6-7.3	Moderate-----	0.32			
	26-60	10-25	1.70-1.90	0.2-0.6	0.05-0.10	7.4-8.4	Low-----------	0.32			
224E------------- Strawn	0-7	18-27	1.15-1.45	0.6-2.0	0.20-0.24	6.1-7.3	Low-----------	0.37	4	6	1-3
	7-22	27-35	1.35-1.55	0.6-2.0	0.15-0.20	5.6-7.8	Moderate-----	0.37			
	22-60	22-30	1.50-1.70	0.2-0.6	0.08-0.12	7.4-8.4	Low-----------	0.32			
233C2------------ Birkbeck	0-7	15-27	1.30-1.50	0.6-2.0	0.22-0.25	5.1-7.3	Low-----------	0.37	4	6	1-3
	7-44	25-35	1.35-1.55	0.6-2.0	0.14-0.24	4.5-7.3	Moderate-----	0.37			
	44-47	20-30	1.35-1.60	0.2-0.6	0.10-0.18	5.6-7.8	Low-----------	0.37			
	47-60	17-30	1.55-1.90	0.2-0.6	0.05-0.19	6.6-8.4	Low-----------	0.37			
233C3------------ Birkbeck	0-8	27-35	1.35-1.55	0.6-2.0	0.14-0.19	5.1-7.3	Moderate-----	0.37	5	7	.5-1
	8-44	25-35	1.35-1.55	0.6-2.0	0.14-0.24	4.5-7.3	Moderate-----	0.37			
	44-60	17-30	1.55-1.90	0.2-0.6	0.05-0.19	6.6-8.4	Low-----------	0.37			
233D2------------ Birkbeck	0-6	15-27	1.30-1.50	0.6-2.0	0.22-0.25	5.1-7.3	Low-----------	0.37	5	6	1-3
	6-45	25-35	1.35-1.55	0.6-2.0	0.14-0.24	4.5-7.3	Moderate-----	0.37			
	45-58	20-30	1.35-1.60	0.2-0.6	0.10-0.18	5.6-7.8	Low-----------	0.37			
	58-60	17-30	1.55-1.90	0.2-0.6	0.05-0.19	6.6-8.4	Low-----------	0.37			
243A, 243B, 243C2----------- St. Charles	0-10	20-27	1.15-1.30	0.6-2.0	0.22-0.24	5.1-7.8	Low-----------	0.37	5	6	1-3
	10-48	25-35	1.30-1.50	0.6-2.0	0.18-0.20	4.5-7.3	Moderate-----	0.37			
	48-55	15-30	1.30-1.50	0.6-2.0	0.11-0.16	5.1-7.3	Low-----------	0.32			
	55-60	15-25	1.55-1.75	0.6-2.0	0.11-0.16	5.6-8.4	Low-----------	0.24			
266A------------- Disco	0-26	8-20	1.35-1.65	2.0-6.0	0.13-0.15	5.1-6.5	Low-----------	0.20	4	3	2-3
	26-41	5-20	1.45-1.70	2.0-6.0	0.08-0.12	5.1-7.3	Low-----------	0.20			
	41-60	3-12	1.45-1.70	6.0-20	0.05-0.09	5.1-7.3	Low-----------	0.20			
272-------------- Edgington	0-15	20-27	1.20-1.40	0.6-2.0	0.22-0.24	5.1-7.3	Low-----------	0.32	4	6	3-4
	15-28	18-25	1.30-1.50	0.2-0.6	0.20-0.22	5.1-6.0	Low-----------	0.32			
	28-56	27-35	1.35-1.55	0.06-0.2	0.18-0.20	5.1-7.3	Moderate-----	0.32			
	56-60	18-27	1.50-1.70	0.2-0.6	0.20-0.22	5.6-7.3	Low-----------	0.32			
278-------------- Stronghurst	0-7	20-27	1.25-1.45	0.6-2.0	0.22-0.24	5.1-7.3	Low-----------	0.37	5	6	1-3
	7-12	20-27	1.30-1.50	0.6-2.0	0.20-0.22	5.1-7.3	Low-----------	0.37			
	12-40	27-40	1.30-1.55	0.6-2.0	0.18-0.20	5.1-7.3	Moderate-----	0.37			
	40-60	20-27	1.35-1.60	0.6-2.0	0.20-0.22	5.6-7.8	Low-----------	0.37			

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodibility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
279B2------------ Rozetta	0-7	15-27	1.20-1.40	0.6-2.0	0.22-0.24	5.1-7.3	Low----------	0.37	5	6	1-3
	7-44	27-35	1.35-1.55	0.6-2.0	0.18-0.22	4.5-6.0	Moderate-----	0.37			
	44-60	20-27	1.40-1.60	0.6-2.0	0.20-0.22	5.6-7.8	Low----------	0.37			
280C2------------ Fayette	0-7	25-27	1.35-1.45	0.6-2.0	0.18-0.20	5.1-7.3	Moderate-----	0.37	5	6	1-2
	7-57	25-35	1.30-1.45	0.6-2.0	0.18-0.20	4.5-6.5	Moderate-----	0.43			
	57-60	22-26	1.45-1.50	0.6-2.0	0.18-0.20	5.1-7.8	Moderate-----	0.43			
290A------------- Warsaw	0-22	15-25	1.30-1.50	0.6-2.0	0.20-0.24	5.6-7.3	Low----------	0.28	4	5	2-5
	22-38	18-30	1.40-1.65	0.6-2.0	0.13-0.16	6.1-8.4	Low----------	0.28			
	38-60	2-8	1.40-1.65	>20	0.02-0.04	7.9-8.4	Low----------	0.10			
290B------------- Warsaw	0-17	15-25	1.30-1.50	0.6-2.0	0.20-0.24	5.6-7.3	Low----------	0.28	4	5	2-5
	17-33	17-30	1.35-1.60	0.6-2.0	0.16-0.19	5.1-6.5	Low----------	0.28			
	33-60	2-8	1.40-1.65	>20	0.02-0.04	7.9-8.4	Low----------	0.10			
323C3------------ Casco	0-4	27-35	1.40-1.50	0.6-2.0	0.18-0.22	5.6-7.3	Low----------	0.32	2	6	.5-1
	4-22	18-35	1.55-1.65	0.6-2.0	0.09-0.19	5.6-7.8	Moderate-----	0.32			
	22-60	0-2	1.30-1.80	>20	0.02-0.04	7.4-8.4	Low----------	0.10			
329-------------- Will	0-20	20-27	1.25-1.40	0.6-2.0	0.15-0.20	5.6-7.3	Moderate-----	0.28	4	6	5-6
	20-26	23-33	1.35-1.55	0.6-2.0	0.15-0.20	6.1-8.4	Moderate-----	0.28			
	26-60	3-10	1.65-1.85	6.0-20	0.02-0.04	7.4-8.4	Low----------	0.10			
347-------------- Canisteo	0-17	18-27	1.20-1.30	0.6-2.0	0.20-0.22	7.4-8.4	Moderate-----	0.32	5	4L	4-8
	17-41	20-35	1.35-1.50	0.6-2.0	0.15-0.19	7.4-8.4	Moderate-----	0.32			
	41-60	10-35	1.30-1.50	0.6-2.0	0.12-0.18	7.4-8.4	Low----------	0.32			
379A, 379B------- Dakota	0-15	14-27	1.40-1.50	0.6-2.0	0.20-0.22	5.1-7.3	Low----------	0.24	4	5	2-5
	15-31	18-32	1.30-1.55	0.6-2.0	0.15-0.19	5.1-7.3	Low----------	0.32			
	31-60	1-4	1.55-1.65	6.0-20	0.02-0.10	5.1-7.8	Low----------	0.15			
386B------------- Downs	0-12	15-25	1.25-1.30	2.0-6.0	0.21-0.23	5.1-7.3	Low----------	0.32	5	6	2-3
	12-50	26-35	1.30-1.35	0.6-2.0	0.18-0.20	5.1-7.3	Moderate-----	0.43			
	50-60	18-27	1.35-1.45	0.6-2.0	0.18-0.20	5.6-7.3	Moderate-----	0.43			
387A------------- Ockley	0-18	5-15	1.40-1.50	0.6-2.0	0.11-0.16	4.5-6.5	Low----------	0.24	5	3	.5-3
	18-36	20-35	1.45-1.60	0.6-2.0	0.15-0.22	4.5-6.0	Moderate-----	0.37			
	36-50	20-35	1.40-1.55	0.6-2.0	0.06-0.11	5.6-6.5	Moderate-----	0.24			
	50-60	2-5	1.60-1.80	>20	0.02-0.04	7.4-8.4	Low----------	0.10			
439-------------- Jasper	0-15	10-22	1.30-1.45	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.28	5	5	2-4
	15-46	20-32	1.40-1.60	0.6-2.0	0.13-0.19	5.1-6.5	Low----------	0.28			
	46-60	2-10	1.50-1.70	6.0-20	0.05-0.10	6.1-7.8	Low----------	0.17			
447-------------- Canisteo	0-14	20-27	1.40-1.60	0.6-2.0	0.20-0.24	7.4-8.4	Moderate-----	0.28	5	4L	4-8
	14-48	25-35	1.35-1.50	0.6-2.0	0.15-0.19	7.4-8.4	Moderate-----	0.28			
	48-60	2-12	1.65-1.80	6.0-20	0.05-0.10	7.4-8.4	Low----------	0.17			
533*. Urban land											
684B------------- Broadwell	0-13	20-27	1.25-1.45	0.6-2.0	0.23-0.26	5.6-7.3	Low----------	0.32	5	6	3-5
	13-42	20-35	1.35-1.60	0.6-2.0	0.14-0.24	5.6-7.3	Moderate-----	0.43			
	42-60	3-10	1.55-1.75	6.0-20	0.08-0.11	5.6-7.3	Low----------	0.15			
684C2------------ Broadwell	0-8	20-27	1.25-1.45	0.6-2.0	0.23-0.26	5.6-7.3	Low----------	0.32	5	6	3-5
	8-46	20-35	1.35-1.60	0.6-2.0	0.14-0.24	5.6-7.3	Moderate-----	0.43			
	46-60	3-15	1.55-1.75	6.0-20	0.08-0.11	5.6-7.3	Low----------	0.15			

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodibility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
689B------------- Coloma	0-6	0-10	1.35-1.65	6.0-20	0.05-0.09	4.5-7.3	Low-----------	0.15	5	1	.5-2
	6-40	0-10	1.35-1.65	6.0-20	0.05-0.12	4.5-7.3	Low-----------	0.15			
	40-60	2-12	1.50-1.65	6.0-20	0.03-0.08	4.5-7.3	Low-----------	0.15			
802*------------- Orthents	0-60	2-18	1.50-1.70	0.6-2.0	0.08-0.14	---	Low-----------	0.24	5	3	---
	60-80	---	---	0.06-2.0	---	---	-------------	----			
865*. Pits											
935F*, 935G*:											
Miami-----------	0-4	11-22	1.30-1.45	0.6-2.0	0.20-0.24	5.6-7.3	Low-----------	0.37	4	5	.5-3
	4-31	24-35	1.45-1.65	0.6-2.0	0.15-0.20	5.1-7.3	Moderate-----	0.37			
	31-36	20-27	1.50-1.70	0.2-0.6	0.14-0.19	6.6-7.8	Low-----------	0.37			
	36-60	15-25	1.70-1.90	0.2-0.6	0.05-0.10	7.4-8.4	Moderate-----	0.37			
Hennepin--------	0-5	20-27	1.20-1.40	0.6-2.0	0.18-0.24	6.1-7.8	Low-----------	0.28	4	6	1-2
	5-16	18-30	1.30-1.60	0.2-0.6	0.14-0.22	6.1-8.4	Low-----------	0.32			
	16-60	18-30	1.70-1.85	0.2-0.6	0.10-0.15	7.4-8.4	Low-----------	0.32			
2043*:											
Ipava-----------	0-11	20-27	1.15-1.35	0.6-2.0	0.22-0.24	5.6-7.3	Moderate-----	0.28	5	6	4-5
	11-38	35-43	1.25-1.50	0.2-0.6	0.11-0.20	5.6-7.8	High----------	0.43			
	38-60	20-30	1.30-1.55	0.2-0.6	0.20-0.22	6.1-8.4	Moderate-----	0.43			
Urban land.											
2068*:											
Sable-----------	0-6	27-35	1.15-1.35	0.6-2.0	0.21-0.23	5.6-7.3	Moderate-----	0.28	5	7	5-6
	6-21	27-35	1.20-1.40	0.6-2.0	0.18-0.20	5.6-7.3	Moderate-----	0.28			
	21-53	24-35	1.30-1.50	0.6-2.0	0.18-0.20	5.6-7.8	Moderate-----	0.28			
	53-60	20-28	1.30-1.50	0.6-2.0	0.20-0.22	6.6-8.4	Low-----------	0.28			
Urban land.											
2088B*:											
Sparta----------	0-11	3-10	1.20-1.40	2.0-6.0	0.09-0.12	5.1-7.3	Low-----------	0.17	5	2	1-2
	11-20	1-8	1.40-1.60	6.0-20	0.05-0.11	5.1-7.3	Low-----------	0.17			
	20-60	0-5	1.50-1.70	6.0-20	0.04-0.07	5.1-7.3	Low-----------	0.17			
Urban land.											
2266B*:											
Disco------------	0-23	8-20	1.35-1.65	2.0-6.0	0.13-0.15	5.1-6.5	Low-----------	0.20	4	3	2-3
	23-45	5-20	1.45-1.70	6.0-20	0.05-0.09	5.1-7.3	Low-----------	0.20			
	45-60	3-12	1.45-1.70	6.0-20	0.05-0.09	5.1-7.3	Low-----------	0.20			
Urban land.											
2278*:											
Stronghurst-----	0-7	20-27	1.25-1.45	0.6-2.0	0.22-0.24	5.1-7.3	Low-----------	0.37	5	6	1-3
	7-50	27-35	1.30-1.55	0.6-2.0	0.18-0.20	5.1-7.3	Moderate-----	0.37			
	50-60	20-27	1.35-1.60	0.6-2.0	0.20-0.22	5.6-7.8	Low-----------	0.37			
Urban land.											
2279B*:											
Rozetta---------	0-12	15-27	1.20-1.40	0.6-2.0	0.22-0.24	5.1-7.3	Low-----------	0.37	5	6	1-3
	12-56	27-35	1.35-1.55	0.6-2.0	0.18-0.22	4.5-6.0	Moderate-----	0.37			
	56-60	20-27	1.40-1.60	0.6-2.0	0.20-0.22	5.6-7.8	Low-----------	0.37			

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodibility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
2279B*:											
Urban land.											
3028-------------	0-12	10-20	1.15-1.40	0.6-2.0	0.20-0.24	7.4-8.4	Low----------	0.37	5	4L	1-2
Jules	12-60	8-18	1.20-1.50	0.6-2.0	0.17-0.22	7.4-8.4	Low----------	0.37			
3073-------------	0-13	15-27	1.20-1.45	0.6-2.0	0.19-0.24	6.1-7.8	Low----------	0.32	5	5	3-5
Ross	13-43	18-32	1.20-1.50	0.6-2.0	0.16-0.22	6.1-8.4	Low----------	0.32			
	43-60	5-25	1.35-1.60	0.6-6.0	0.05-0.18	6.1-8.4	Low----------	0.32			
3074-------------	0-19	18-27	1.40-1.60	0.6-2.0	0.22-0.24	5.6-7.8	Low----------	0.28	5	6	2-4
Radford	19-26	18-27	1.40-1.60	0.6-2.0	0.20-0.22	6.1-7.8	Low----------	0.28			
	26-60	24-35	1.35-1.55	0.6-2.0	0.18-0.20	6.6-7.8	Moderate-----	0.28			
3077-------------	0-24	18-27	1.15-1.35	0.6-2.0	0.22-0.24	5.6-7.8	Moderate-----	0.28	5	6	3-4
Huntsville	24-60	18-27	1.20-1.40	0.6-2.0	0.20-0.22	5.6-7.8	Moderate-----	0.28			
3107-------------	0-27	27-35	1.20-1.40	0.6-2.0	0.21-0.23	6.1-7.8	Moderate-----	0.28	5	7	4-5
Sawmill	27-52	25-35	1.30-1.45	0.6-2.0	0.17-0.20	6.1-7.8	Moderate-----	0.28			
	52-60	18-35	1.35-1.50	0.6-2.0	0.15-0.19	6.1-8.4	Moderate-----	0.28			
3304-------------	0-21	7-20	1.40-1.60	2.0-6.0	0.13-0.20	5.6-8.4	Low----------	0.20	4	3	1-2
Landes	21-39	5-18	1.60-1.70	2.0-6.0	0.10-0.15	5.6-8.4	Low----------	0.32			
	39-60	5-18	1.60-1.80	6.0-20	0.05-0.15	5.6-8.4	Low----------	0.20			
3451-------------	0-11	10-27	1.20-1.55	0.6-2.0	0.22-0.24	6.1-7.8	Low----------	0.28	5	5	3-7
Lawson	11-32	10-30	1.20-1.55	0.6-2.0	0.18-0.22	6.1-7.8	Low----------	0.28			
	32-40	18-30	1.55-1.65	0.6-2.0	0.18-0.20	6.1-7.8	Moderate-----	0.43			
	40-60	18-30	1.50-1.70	0.6-2.0	0.11-0.15	6.1-7.8	Moderate-----	0.43			
7070-------------	0-11	27-35	1.15-1.35	0.2-0.6	0.15-0.20	5.6-7.8	Moderate-----	0.32	5	7	5-6
Beaucoup	11-60	27-35	1.30-1.50	0.2-0.6	0.18-0.20	5.6-7.8	Moderate-----	0.32			
7302-------------	0-10	18-35	1.30-1.55	0.6-2.0	0.15-0.22	5.6-7.3	Moderate-----	0.28	5	6	2-3
Ambraw	10-39	30-42	1.30-1.55	0.2-0.6	0.08-0.19	5.1-7.3	Moderate-----	0.32			
	39-52	24-35	1.40-1.65	0.2-2.0	0.10-0.15	5.1-7.3	Moderate-----	0.32			
	52-60	18-30	1.35-1.65	0.2-2.0	0.11-0.22	6.1-8.4	Low----------	0.43			
7404-------------	0-11	40-45	1.30-1.50	0.06-0.2	0.11-0.18	6.1-7.3	High---------	0.32	5	4	2-4
Titus	11-60	35-45	1.30-1.60	0.06-0.2	0.11-0.22	6.1-7.8	High---------	0.32			
8028-------------	0-10	10-20	1.15-1.40	0.6-2.0	0.20-0.24	7.4-8.4	Low----------	0.37	5	4L	1-2
Jules	10-60	8-18	1.20-1.50	0.6-2.0	0.17-0.22	7.4-8.4	Low----------	0.37			
8284-------------	0-7	22-27	1.25-1.45	0.6-2.0	0.21-0.24	6.1-7.8	Moderate-----	0.32	5	6	2-3
Tice	7-50	24-35	1.30-1.50	0.6-2.0	0.18-0.20	5.6-7.8	Moderate-----	0.32			
	50-60	15-30	1.40-1.60	0.6-2.0	0.11-0.18	5.6-7.8	Moderate-----	0.32			

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 17.--SOIL AND WATER FEATURES

("Flooding," "water table," and terms such as "rare," "brief," and "apparent" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Soil name and map symbol	Hydrologic group	Flooding: Frequency	Flooding: Duration	Flooding: Months	High water table: Depth	High water table: Kind	High water table: Months	Potential frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
					Ft					
19C2, 19D2-------- Sylvan	B	None---------	---	---	>6.0	---	---	High-----	Moderate	Moderate.
27C2, 27D2-------- Miami	B	None---------	---	---	>6.0	---	---	Moderate	Moderate	Moderate.
36B--------------- Tama	B	None---------	---	---	4.0-6.0	Apparent	Nov-Jun	High-----	Moderate	Moderate.
36C2-------------- Tama	B	None---------	---	---	>6.0	---	---	High-----	Moderate	Moderate.
43---------------- Ipava	B	None---------	---	---	1.0-3.0	Apparent	Mar-Jun	High-----	High-----	Moderate.
45---------------- Denny	D	None---------	---	---	+1-2.0	Apparent	Mar-Jun	High-----	High-----	Moderate.
54B, 54D, 54F----- Plainfield	A	None---------	---	---	>6.0	---	---	Low------	Low------	High.
61---------------- Atterberry	B	None---------	---	---	1.0-3.0	Apparent	Mar-Jun	High-----	High-----	Moderate.
67---------------- Harpster	B/D	None---------	---	---	+.5-2.0	Apparent	Feb-Jun	High-----	High-----	Low.
68---------------- Sable	B/D	None---------	---	---	+.5-2.0	Apparent	Mar-Jun	High-----	High-----	Low.
88B, 88D---------- Sparta	A	None---------	---	---	>6.0	---	---	Low------	Low------	Moderate.
93D, 93F---------- Rodman	A	None---------	---	---	>6.0	---	---	Low------	Low------	Low.
100--------------- Palms	A/D	None---------	---	---	+1-1.0	Apparent	Nov-May	High-----	High-----	Moderate.
102--------------- La Hogue	B	None---------	---	---	1.0-3.0	Apparent	Feb-Jun	High-----	High-----	Moderate.
103--------------- Houghton	A/D	None---------	---	---	+1-1.0	Apparent	Sep-Jun	High-----	High-----	Low.
125--------------- Selma	B/D	None---------	---	---	+.5-2.0	Apparent	Mar-Jun	High-----	High-----	Low.
131A, 131B, 131D-- Alvin	B	None---------	---	---	>6.0	---	---	Moderate	Low------	High.
134A, 134B-------- Camden	B	None---------	---	---	>6.0	---	---	High-----	Low------	Moderate.
138--------------- Shiloh	B/D	None---------	---	---	+1-2.0	Apparent	Mar-Jun	High-----	High-----	Low.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months		Uncoated steel	Concrete
					Ft					
145C2------------- Saybrook	B	None--------	---	---	>6.0	---	---	High-----	High-----	Moderate.
148--------------- Proctor	B	None--------	---	---	>6.0	---	---	High-----	Moderate	Moderate.
150A, 150B-------- Onarga	B	None--------	---	---	>6.0	---	---	Moderate	Low------	High.
151--------------- Ridgeville	B	None--------	---	---	1.0-3.0	Apparent	Feb-May	High-----	Moderate	Moderate.
152--------------- Drummer	B/D	None--------	---	---	+.5-2.0	Apparent	Mar-Jun	High-----	High-----	Moderate.
171C2------------- Catlin	B	None--------	---	---	3.5-6.0	Apparent	Feb-May	High-----	High-----	Moderate.
198--------------- Elburn	B	None--------	---	---	1.0-3.0	Apparent	Jan-May	High-----	High-----	Moderate.
199A-------------- Plano	B	None--------	---	---	>6.0	---	---	High-----	Moderate	Low.
199B-------------- Plano	B	None--------	---	---	3.0-6.0	Apparent	Mar-May	High-----	Moderate	Low.
200--------------- Orio	B/D	None--------	---	---	+.5-1.0	Apparent	Mar-Jun	High-----	High-----	Moderate.
201--------------- Gilford	B/D	None--------	---	---	+.5-1.0	Apparent	Dec-May	High-----	High-----	Moderate.
221C2------------- Parr	B	None--------	---	---	>6.0	---	---	Moderate	High-----	Moderate.
224E-------------- Strawn	B	None--------	---	---	>6.0	---	---	Moderate	Moderate	Moderate.
233C2, 233C3, 233D2------------ Birkbeck	B	None--------	---	---	3.0-6.0	Apparent	Mar-May	High-----	High-----	Moderate.
243A, 243B, 243C2- St. Charles	B	None--------	---	---	>6.0	---	---	High-----	Moderate	Moderate.
266A-------------- Disco	B	None--------	---	---	>6.0	---	---	Moderate	Low------	High.
272--------------- Edgington	C/D	None--------	---	---	+.5-2.0	Apparent	Feb-Jun	High-----	High-----	Moderate.
278--------------- Stronghurst	B	None--------	---	---	1.0-3.0	Apparent	Mar-Jun	High-----	High-----	Moderate.
279B2------------- Rozetta	B	None--------	---	---	4.0-6.0	Apparent	Mar-Jun	High-----	Moderate	Moderate.
280C2------------- Fayette	B	None--------	---	---	>6.0	---	---	High-----	Moderate	Moderate.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding: Frequency	Flooding: Duration	Flooding: Months	High water table: Depth	High water table: Kind	High water table: Months	Potential frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
					Ft					
290A, 290B-------- Warsaw	B	None--------	---	---	>6.0	---	---	Moderate	Low------	Moderate.
323C3------------- Casco	B	None--------	---	---	>6.0	---	---	Low------	Moderate	Low.
329--------------- Will	B/D	None--------	---	---	+.5-2.0	Apparent	Mar-Jun	High-----	High-----	Moderate.
347--------------- Canisteo	B/D	None--------	---	---	+1-1.0	Apparent	Oct-Jul	High-----	High-----	Low.
379A, 379B-------- Dakota	B	None--------	---	---	>6.0	---	---	Moderate	Low------	Moderate.
386B-------------- Downs	B	None--------	---	---	4.0-6.0	Apparent	Mar-Jun	High-----	Moderate	Moderate.
387A-------------- Ockley	B	None--------	---	---	>6.0	---	---	Moderate	Moderate	Moderate.
439--------------- Jasper	B	None--------	---	---	>6.0	---	---	Moderate	Moderate	Moderate.
447--------------- Canisteo	B/D	None--------	---	---	+1-1.0	Apparent	Mar-Jun	High-----	High-----	Low.
533*. Urban land										
684B, 684C2------- Broadwell	B	None--------	---	---	>6.0	---	---	High-----	Moderate	Moderate.
689B-------------- Coloma	A	None--------	---	---	>6.0	---	---	Low------	Low------	Moderate.
802*-------------- Orthents	-	None--------	---	---	>6.0	---	---	---	---	---
865*. Pits										
935F*, 935G*:										
Miami------------	B	None--------	---	---	>6.0	---	---	Moderate	Moderate	Moderate.
Hennepin---------	B	None--------	---	---	>6.0	---	---	Moderate	Low------	Low.
2043*:										
Ipava------------	B	None--------	---	---	1.0-3.0	Apparent	Mar-Jun	High-----	High-----	Moderate.
Urban land.										
2068*:										
Sable------------	B/D	None--------	---	---	+.5-2.0	Apparent	Mar-Jun	High-----	High-----	Low.
Urban land.										
2088B*:										
Sparta-----------	A	None--------	---	---	>6.0	---	---	Low------	Low------	Moderate.
Urban land.										

See footnote at end of table.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding: Frequency	Flooding: Duration	Flooding: Months	High water table: Depth	High water table: Kind	High water table: Months	Potential frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
					Ft					
2266B*:										
Disco	B	None	---	---	>6.0	---	---	Moderate	Low	High.
Urban land.										
2278*:										
Stronghurst	B	None	---	---	1.0-3.0	Apparent	Mar-Jun	High	High	Moderate.
Urban land.										
2279B*:										
Rozetta	B	None	---	---	4.0-6.0	Apparent	Mar-Jun	High	Moderate	Moderate.
Urban land.										
3028 Jules	B	Frequent	Long	Oct-Jun	3.5-6.0	Apparent	Mar-May	High	Low	Low.
3073 Ross	B	Frequent	Brief	Oct-Jun	4.0-6.0	Apparent	Feb-Apr	Moderate	Low	Low.
3074 Radford	B	Frequent	Brief	Mar-Jun	1.0-3.0	Apparent	Mar-Jun	High	High	Low.
3077 Huntsville	B	Frequent	Brief	Oct-Jun	>6.0	---	---	High	Low	Low.
3107 Sawmill	B/D	Frequent	Brief	Mar-Jun	0-2.0	Apparent	Mar-Jun	High	High	Low.
3304 Landes	B	Frequent	Brief	Oct-Jun	>6.0	---	---	Moderate	Low	Low.
3451 Lawson	C	Frequent	Brief	Oct-Jun	1.0-3.0	Apparent	Nov-May	High	Moderate	Low.
7070 Beaucoup	B/D	Rare	---	---	+.5-1.0	Apparent	Mar-Jun	High	High	Low.
7302 Ambraw	B/D	Rare	---	---	0-2.0	Apparent	Mar-Jun	High	High	Moderate.
7404 Titus	B/D	Rare	---	---	+.5-2.0	Apparent	Mar-Jun	High	High	Low.
8028 Jules	B	Occasional	Long	Oct-Jun	3.5-6.0	Apparent	Mar-May	High	Low	Low.
8284 Tice	B	Occasional	Brief	Oct-Jun	1.5-3.0	Apparent	Mar-Jun	High	High	Low.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 18.--CLASSIFICATION OF THE SOILS

(An asterisk in the first column indicates that in one or more of the map units the soil is a taxadjunct to the series. The text identifies those map units and describes the characteristics of the soil that are outside the range of the series)

Soil name	Family or higher taxonomic class
Alvin	Coarse-loamy, mixed, mesic Typic Hapludalfs
Ambraw	Fine-loamy, mixed, mesic Fluvaquentic Haplaquolls
Atterberry	Fine-silty, mixed, mesic Udollic Ochraqualfs
Beaucoup	Fine-silty, mixed, mesic Fluvaquentic Haplaquolls
Birkbeck	Fine-silty, mixed, mesic Typic Hapludalfs
*Broadwell	Fine-silty, mixed, mesic Typic Argiudolls
Camden	Fine-silty, mixed, mesic Typic Hapludalfs
Canisteo	Fine-loamy, mixed (calcareous), mesic Typic Haplaquolls
Casco	Fine-loamy over sandy or sandy-skeletal, mixed, mesic Typic Hapludalfs
*Catlin	Fine-silty, mixed, mesic Typic Argiudolls
Coloma	Mixed, mesic Argic Udipsamments
Dakota	Fine-loamy over sandy or sandy-skeletal, mixed, mesic Typic Argiudolls
Denny	Fine, montmorillonitic, mesic Mollic Albaqualfs
Disco	Coarse-loamy, mixed, mesic Cumulic Hapludolls
Downs	Fine-silty, mixed, mesic Mollic Hapludalfs
Drummer	Fine-silty, mixed, mesic Typic Haplaquolls
Edgington	Fine-silty, mixed, mesic Argiaquic Argialbolls
Elburn	Fine-silty, mixed, mesic Aquic Argiudolls
Fayette	Fine-silty, mixed, mesic Typic Hapludalfs
Gilford	Coarse-loamy, mixed, mesic Typic Haplaquolls
Harpster	Fine-silty, mesic Typic Calciaquolls
Hennepin	Fine-loamy, mixed, mesic Typic Eutrochrepts
Houghton	Euic, mesic Typic Medisaprists
Huntsville	Fine-silty, mixed, mesic Cumulic Hapludolls
Ipava	Fine, montmorillonitic, mesic Aquic Argiudolls
Jasper	Fine-loamy, mixed, mesic Typic Argiudolls
Jules	Coarse-silty, mixed (calcareous), mesic Typic Udifluvents
La Hogue	Fine-loamy, mixed, mesic Aquic Argiudolls
Landes	Coarse-loamy, mixed, mesic Fluventic Hapludolls
Lawson	Fine-silty, mixed, mesic Cumulic Hapludolls
Miami	Fine-loamy, mixed, mesic Typic Hapludalfs
Ockley	Fine-loamy, mixed, mesic Typic Hapludalfs
Onarga	Coarse-loamy, mixed, mesic Typic Argiudolls
Orio	Fine-loamy, mixed, mesic Mollic Ochraqualfs
Orthents	Orthents
Palms	Loamy, mixed, euic, mesic Terric Medisaprists
*Parr	Fine-loamy, mixed, mesic Typic Argiudolls
Plainfield	Mixed, mesic Typic Udipsamments
Plano	Fine-silty, mixed, mesic Typic Argiudolls
Proctor	Fine-silty, mixed, mesic Typic Argiudolls
Radford	Fine-silty, mixed, mesic Fluvaquentic Hapludolls
Ridgeville	Coarse-loamy, mixed, mesic Aquic Argiudolls
Rodman	Sandy-skeletal, mixed, mesic Typic Hapludolls
Ross	Fine-loamy, mixed, mesic Cumulic Hapludolls
Rozetta	Fine-silty, mixed, mesic Typic Hapludalfs
Sable	Fine-silty, mixed, mesic Typic Haplaquolls
Sawmill	Fine-silty, mixed, mesic Cumulic Haplaquolls
*Saybrook	Fine-silty, mixed, mesic Typic Argiudolls
Selma	Fine-loamy, mixed, mesic Typic Haplaquolls
Shiloh	Fine, montmorillonitic, mesic Cumulic Haplaquolls
Sparta	Sandy, mixed, mesic Entic Hapludolls
St. Charles	Fine-silty, mixed, mesic Typic Hapludalfs
Strawn	Fine-loamy, mixed, mesic Typic Hapludalfs
Stronghurst	Fine-silty, mixed, mesic Aeric Ochraqualfs
Sylvan	Fine-silty, mixed, mesic Typic Hapludalfs
*Tama	Fine-silty, mixed, mesic Typic Argiudolls
Tice	Fine-silty, mixed, mesic Fluvaquentic Hapludolls
Titus	Fine, montmorillonitic, mesic Fluvaquentic Haplaquolls
Warsaw	Fine-loamy over sandy or sandy-skeletal, mixed, mesic Typic Argiudolls
Will	Fine-loamy over sandy or sandy-skeletal, mixed, mesic Typic Haplaquolls

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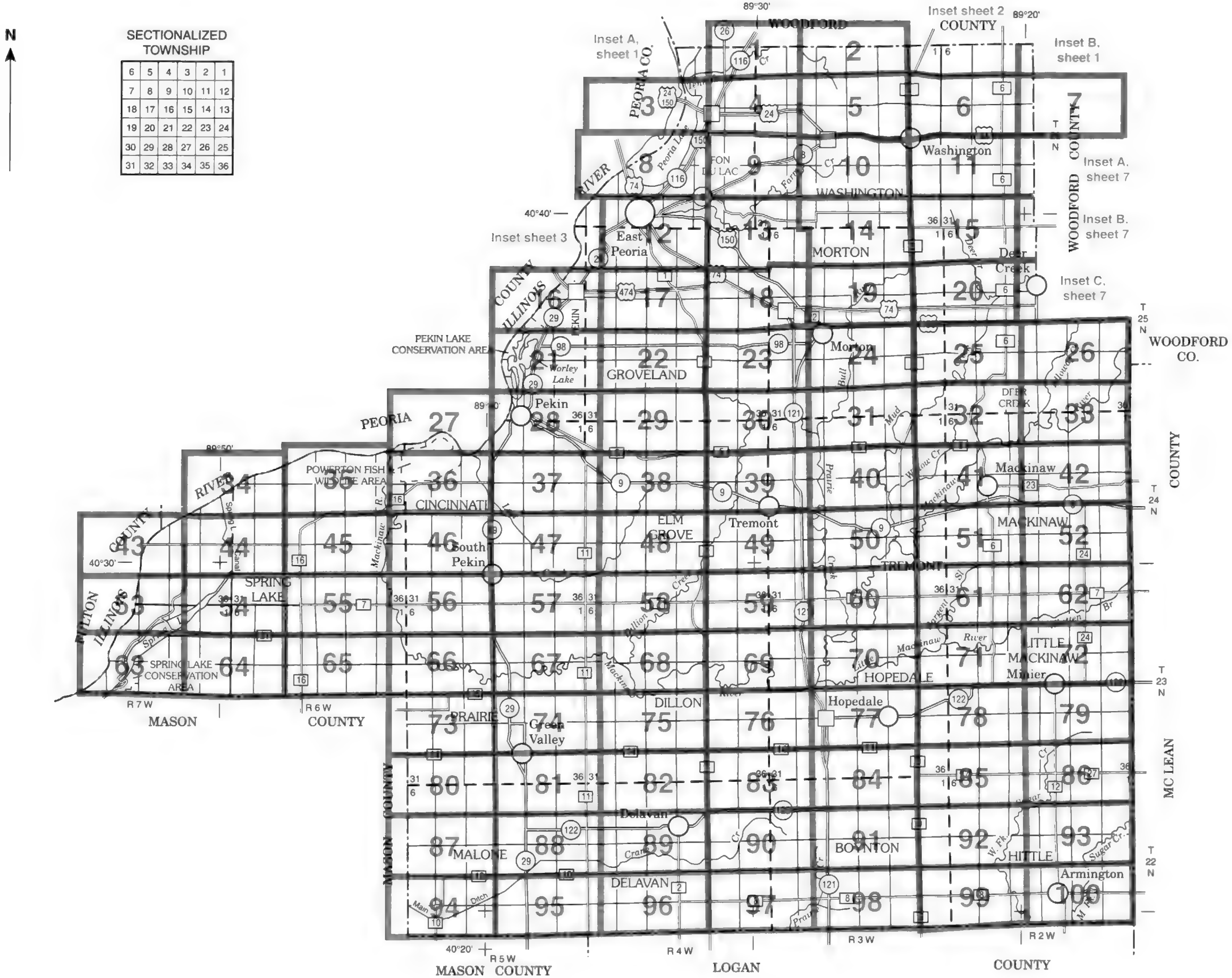


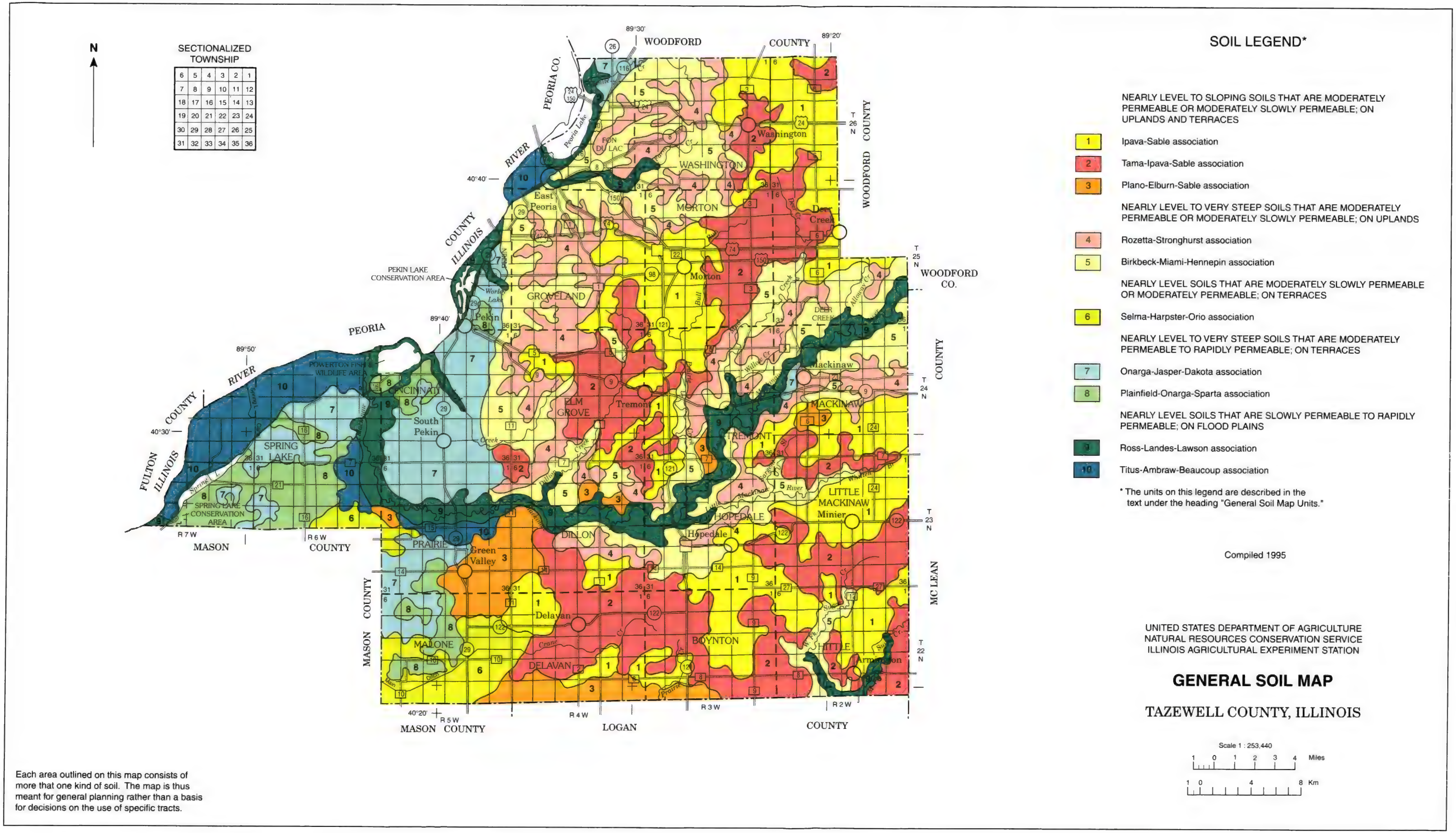
INDEX TO MAP SHEETS

TAZEWELL COUNTY, ILLINOIS

Scale 1 : 253,440

Miles

Km


SECTIONALIZED TOWNSHIP
SOIL LEGEND*
NEARLY LEVEL TO SLOPING SOILS THAT ARE MODERATELY PERMEABLE OR MODERATELY SLOWLY PERMEABLE; ON UPLANDS AND TERRACES
1 Ipava-Sable association
2 Tama-Ipava-Sable association
3 Plano-Elburn-Sable association
NEARLY LEVEL TO VERY STEEP SOILS THAT ARE MODERATELY PERMEABLE OR MODERATELY SLOWLY PERMEABLE; ON UPLANDS
4 Rozetta-Stronghurst association
5 Birkbeck-Miami-Hennepin association
NEARLY LEVEL SOILS THAT ARE MODERATELY SLOWLY PERMEABLE OR MODERATELY PERMEABLE; ON TERRACES
6 Selma-Harpster-Orio association
NEARLY LEVEL TO VERY STEEP SOILS THAT ARE MODERATELY PERMEABLE TO RAPIDLY PERMEABLE; ON TERRACES
7 Onarga-Jasper-Dakota association
8 Plainfield-Onarga-Sparta association
NEARLY LEVEL SOILS THAT ARE SLOWLY PERMEABLE TO RAPIDLY PERMEABLE; ON FLOOD PLAINS
9 Ross-Landes-Lawson association
10 Titus-Ambraw-Beaucoup association
* The units on this legend are described in the text under the heading "General Soil Map Units."
Compiled 1995
UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
ILLINOIS AGRICULTURAL EXPERIMENT STATION
GENERAL SOIL MAP
TAZEWELL COUNTY, ILLINOIS
Scale 1 : 253,440
Miles
Km
WOODFORD COUNTY
PEORIA CO.
PEORIA COUNTY ILLINOIS
FULTON COUNTY ILLINOIS
ILLINOIS RIVER
MASON COUNTY
LOGAN COUNTY
MC LEAN COUNTY
WOODFORD CO.
WASHINGTON
MORTON
GROVELAND
FON DU LAC
ELM GROVE
CINCINNATI
SPRING LAKE
PRAIRIE
DILLON
TREMONT
MACKINAW
DEER CREEK
HOPEDALE
LITTLE MACKINAW
MALONE
DELAVAN
BOYNTON
HITTLE
Washington
Morton
East Peoria
Pekin
South Pekin
Tremont
Mackinaw
Deer Creek
Hopedale
Minier
Green Valley
Delavan
Armington
PEKIN LAKE CONSERVATION AREA
POWERTON FISH & WILDLIFE AREA
SPRING LAKE CONSERVATION AREA
Each area outlined on this map consists of more that one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.

SOIL SURVEY OF TAZEWELL COUNTY, ILLINOIS — SHEET NUMBER 4

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

TAZEWELL COUNTY, ILLINOIS NO. 4

SOIL LEGEND

Map symbols consist of numbers or a combination of numbers and letters. The initial numbers represent the kind of soil. A capital letter following these numbers indicates the class of slope. Symbols without a slope letter are for nearly level soils or miscellaneous areas. A final number of 2 following the slope letter indicates that the soil is moderately eroded and 3 that it is severely eroded.

SYMBOL	NAME
19C2	Sylvan silt loam, 5 to 10 percent slopes, eroded
19D2	Sylvan silt loam, 10 to 18 percent slopes, eroded
27C2	Miami silt loam, 5 to 10 percent slopes, eroded
27D2	Miami silt loam, 10 to 15 percent slopes, eroded
36B	Tama silt loam, 1 to 5 percent slopes
36C2	Tama silt loam, 5 to 10 percent slopes, eroded
43	Ipava silt loam
45	Denny silt loam
54B	Plainfield sand, 3 to 7 percent slopes
54D	Plainfield sand, 7 to 18 percent slopes
54F	Plainfield loamy sand, 18 to 45 percent slopes
61	Atterberry silt loam
67	Harpster silty clay loam
68	Sable silty clay loam
88B	Sparta loamy sand, 1 to 7 percent slopes
88D	Sparta loamy sand, 7 to 15 percent slopes
93D	Rodman gravelly loam, 7 to 18 percent slopes
93F	Rodman gravelly loam, 18 to 40 percent slopes
100	Palms muck
102	La Hogue loam
103	Houghton muck
125	Selma loam
131A	Alvin loamy sand, 0 to 3 percent slopes
131B	Alvin loamy sand, 3 to 7 percent slopes
131D	Alvin fine sandy loam, 7 to 12 percent slopes
134A	Camden silt loam, 0 to 2 percent slopes
134B	Camden silt loam, 2 to 5 percent slopes
138	Shiloh silty clay loam
145C2	Saybrook silt loam, 5 to 12 percent slopes, eroded
148	Proctor silt loam
150A	Onarga sandy loam, 0 to 3 percent slopes
150B	Onarga sandy loam, 3 to 7 percent slopes
151	Ridgeville sandy loam
152	Drummer silty clay loam
171C2	Catlin silt loam, 4 to 10 percent slopes, eroded
198	Elburn silt loam
199A	Plano silt loam, 0 to 2 percent slopes
199B	Plano silt loam, 2 to 5 percent slopes
200	Orio fine sandy loam
201	Gilford sandy loam
221C2	Parr silt loam, 5 to 12 percent slopes, eroded
224E	Strawn loam, 15 to 20 percent slopes
233C2	Birkbeck silt loam, 5 to 10 percent slopes, eroded
233C3	Birkbeck silty clay loam, 5 to 10 percent slopes, severely eroded
233D2	Birkbeck silt loam, 10 to 15 percent slopes, eroded

SYMBOL	NAME
243A	St. Charles silt loam, 0 to 2 percent slopes
243B	St. Charles silt loam, 2 to 5 percent slopes
243C2	St. Charles silt loam, 5 to 10 percent slopes, eroded
266A	Disco sandy loam, 0 to 3 percent slopes
272	Edgington silt loam
278	Stronghurst silt loam
279B2	Rozetta silt loam, 1 to 5 percent slopes, eroded
280C2	Fayette silt loam, 5 to 10 percent slopes, eroded
290A	Warsaw loam, 0 to 2 percent slopes
290B	Warsaw loam, 2 to 7 percent slopes
323C3	Casco clay loam, 5 to 12 percent slopes, severely eroded
329	Will loam
347	Canisteo loam
379A	Dakota loam, 0 to 2 percent slopes
379B	Dakota loam, 2 to 5 percent slopes
386B	Downs silt loam, 1 to 5 percent slopes
387A	Ockley sandy loam, 0 to 2 percent slopes
439	Jasper loam, sandy substratum
447	Canisteo loam, sandy substratum
533	Urban land
684B	Broadwell silt loam, 1 to 5 percent slopes
684C2	Broadwell silt loam, 5 to 10 percent slopes, eroded
689B	Coloma sand, 3 to 7 percent slopes
802	Orthents, loamy
865	Pits, gravel
935F	Miami-Hennipen complex, 20 to 35 percent slopes
935G	Miami-Hennipen complex, 30 to 60 percent slopes
2043	Ipava-Urban land complex
2068	Sable-Urban land complex
2088B	Sparta-Urban land complex, 1 to 7 percent slopes
2266B	Disco-Urban land complex, 1 to 5 percent slopes
2278	Stronghurst-Urban land complex
2279B	Rozetta-Urban land complex, 1 to 7 percent slopes
3028	Jules silt loam, frequently flooded
3073	Ross silt loam, frequently flooded
3074	Radford silt loam, frequently flooded
3077	Huntsville silt loam, frequently flooded
3107	Sawmill silty clay loam, frequently flooded
3304	Landes fine sandy loam, frequently flooded
3451	Lawson silt loam, frequently flooded
7070	Beaucoup silty clay loam, rarely flooded
7302	Ambraw loam, rarely flooded
7404	Titus silty clay, rarely flooded
8028	Jules silt loam, occasionally flooded
8284	Tice silt loam, occasionally flooded

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES

- County
- Reservation (national forest or park, state forest or park, and large airport)
- Field sheet matchline & neatline

AD HOC BOUNDARY (label)

- Small airport, airfield, park, oilfield, cemetery, or flood pool

STATE COORDINATE TICK
1 890 000 FEET

LAND DIVISION CORNER
(sections and land grants)

ROAD EMBLEM & DESIGNATIONS

- Interstate
- Federal
- State

LEVEES

- Without road

DAMS

- Large (to scale)
- Medium or Small

PITS

- Gravel pit

WATER FEATURES

DRAINAGE

- Perennial, double line
- Perennial, single line
- Intermittent
- Drainage end
- Drainage and/or irrigation

LAKES, PONDS AND RESERVOIRS

- Perennial
- Intermittent

MISCELLANEOUS WATER FEATURES

- Marsh or swamp
- Wet spot

SPECIAL SYMBOLS FOR SOIL SURVEY

SOIL DELINEATIONS AND SYMBOLS

ESCARPMENTS

- Other than bedrock (points down slope)

SHORT STEEP SLOPE

DEPRESSION OR SINK

SOIL SAMPLE (normally not shown)

MISCELLANEOUS

- Gravelly spot
- Sandy spot
- Severely eroded spot
- Calcareous soil spot
- Gray soil spot

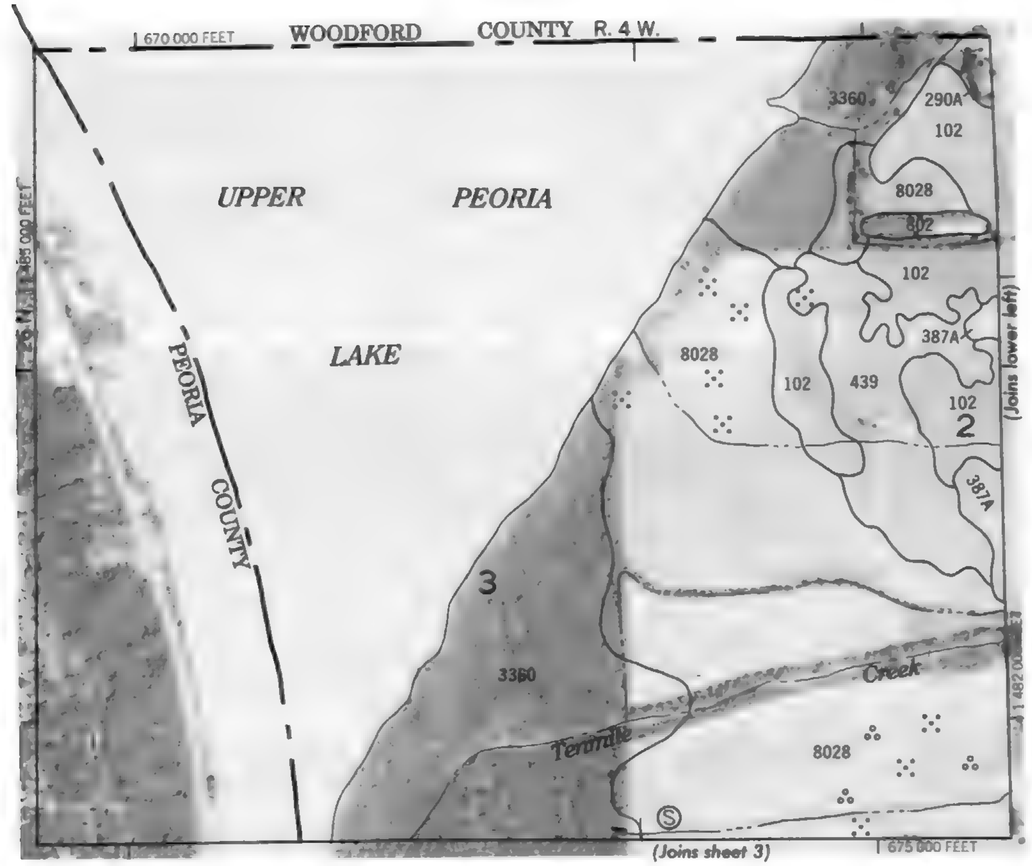
Miscellaneous and ad hoc symbols represent areas less than 3 acres in size.

TAZEWELL COUNTY, ILLINOIS NO. 1

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

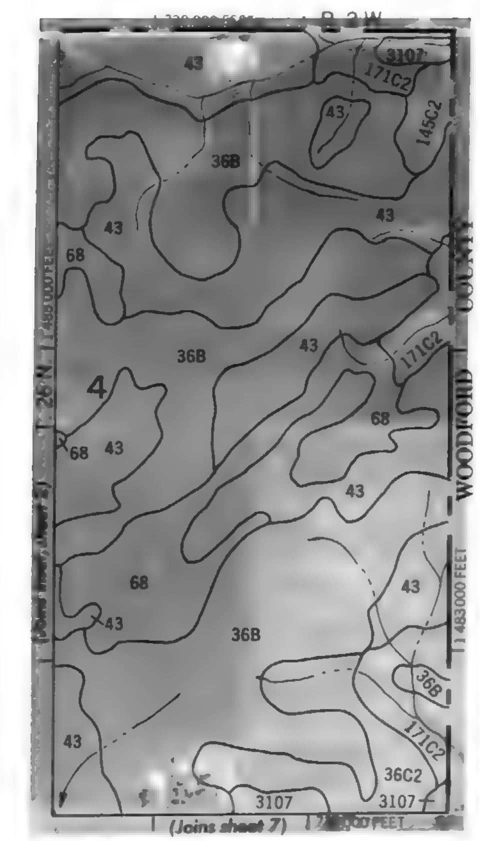
SOIL SURVEY OF TAZEWELL COUNTY, ILLINOIS — SHEET NUMBER 1

INSET A

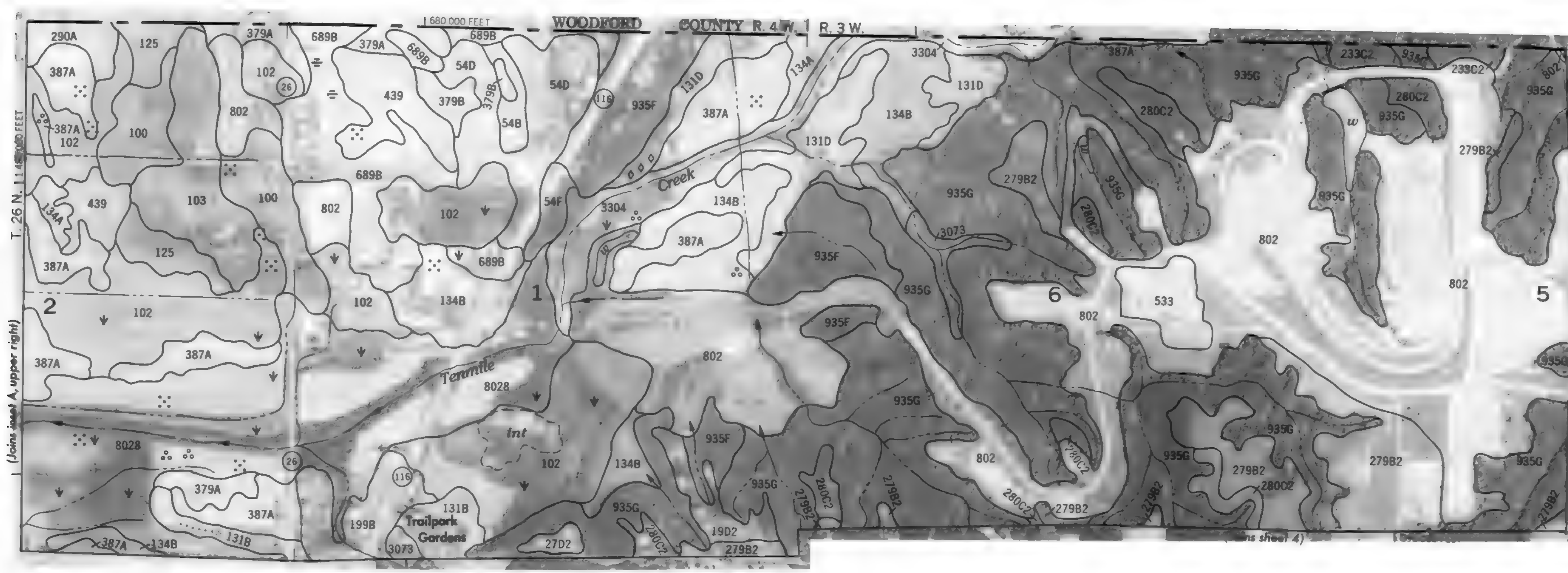


3000 AND 5000-FOOT GRID TICKS

INSET B



1000 AND 2000-FOOT GRID TICKS



1

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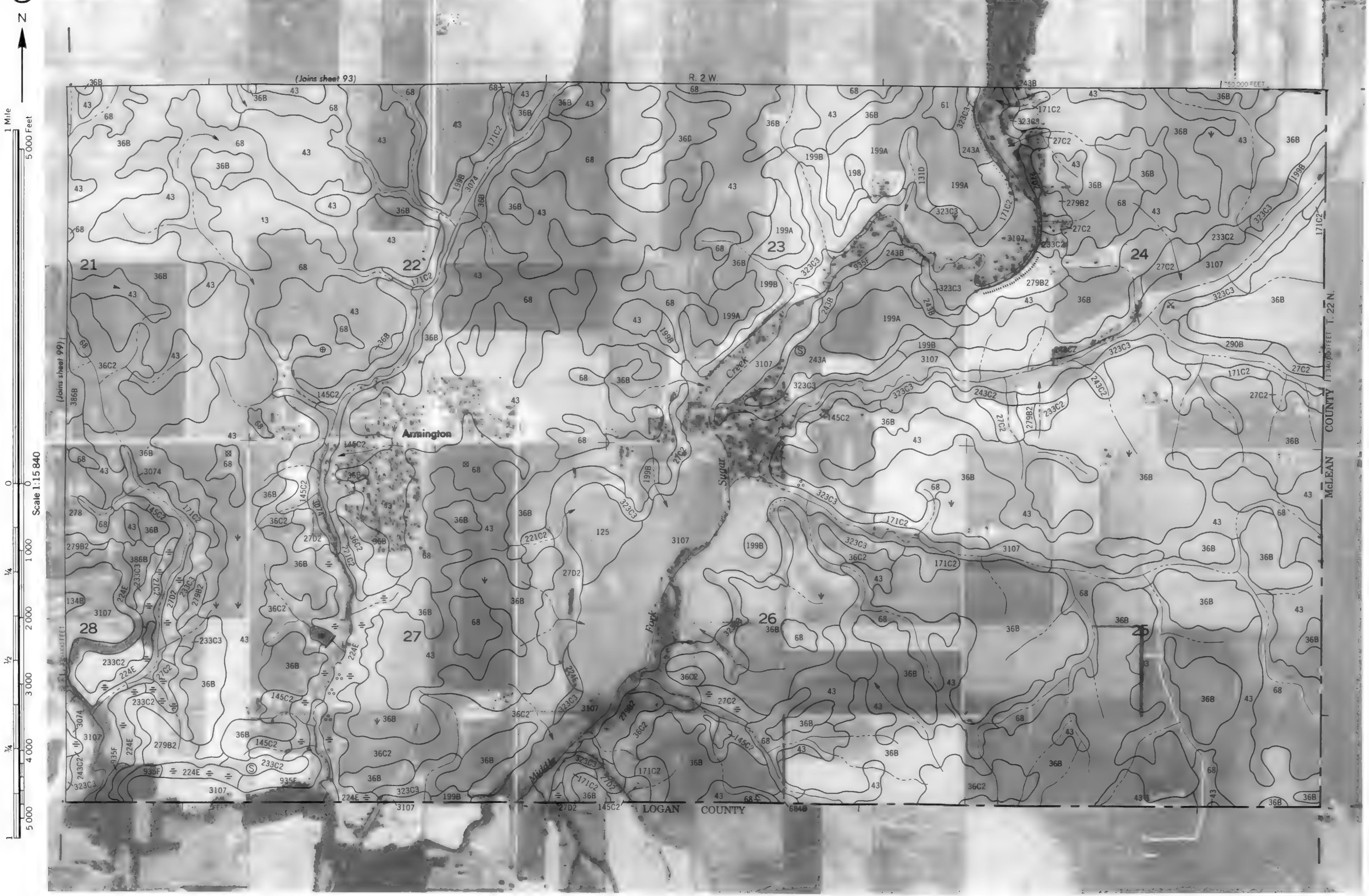

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TAZEWELL COUNTY, ILLINOIS NO. 100

TAZEWELL COUNTY, ILLINOIS NO. 11

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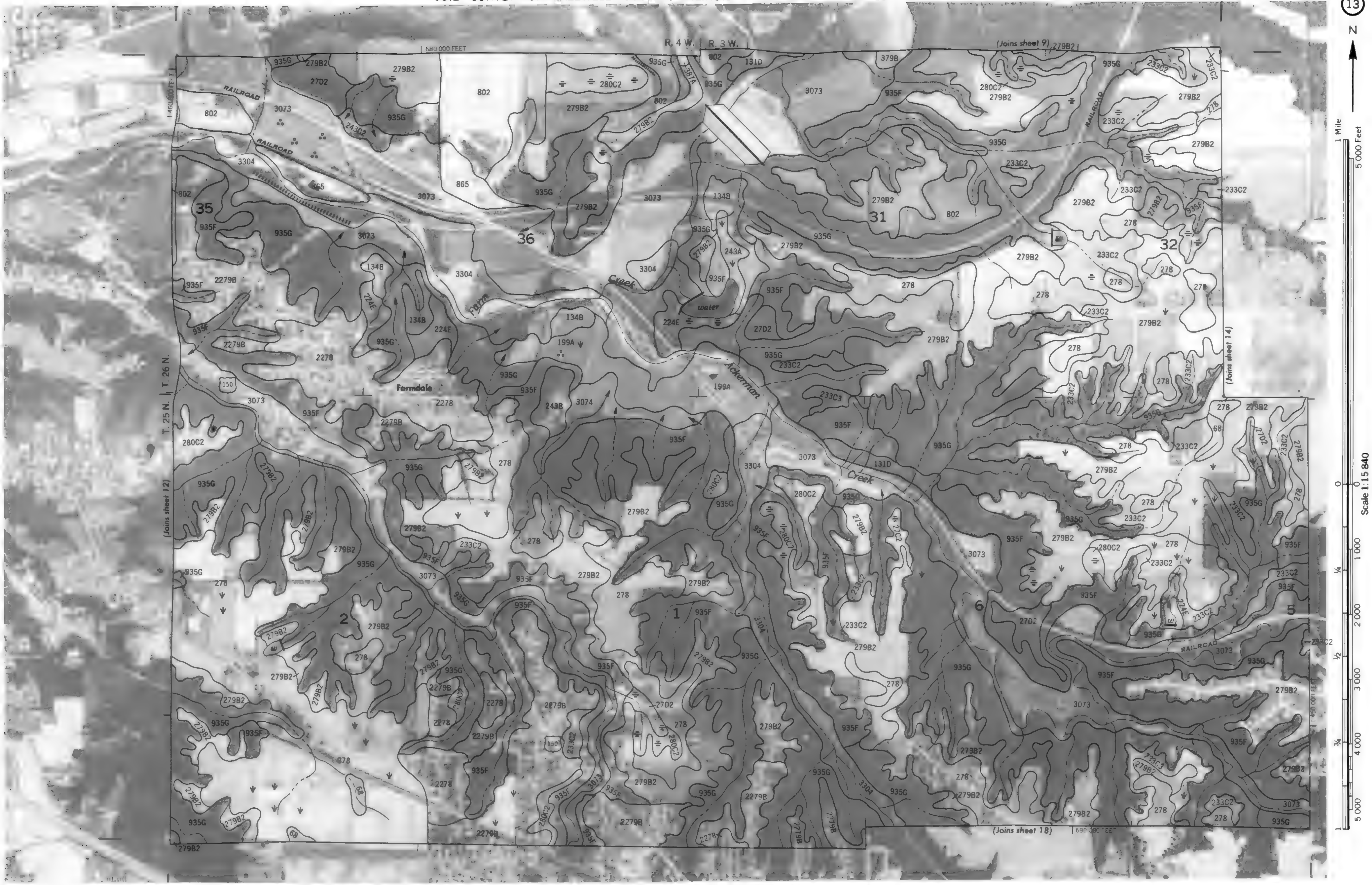
TAZEWELL COUNTY, ILLINOIS NO. 12



TAZEWELL COUNTY, ILLINOIS NO. 13

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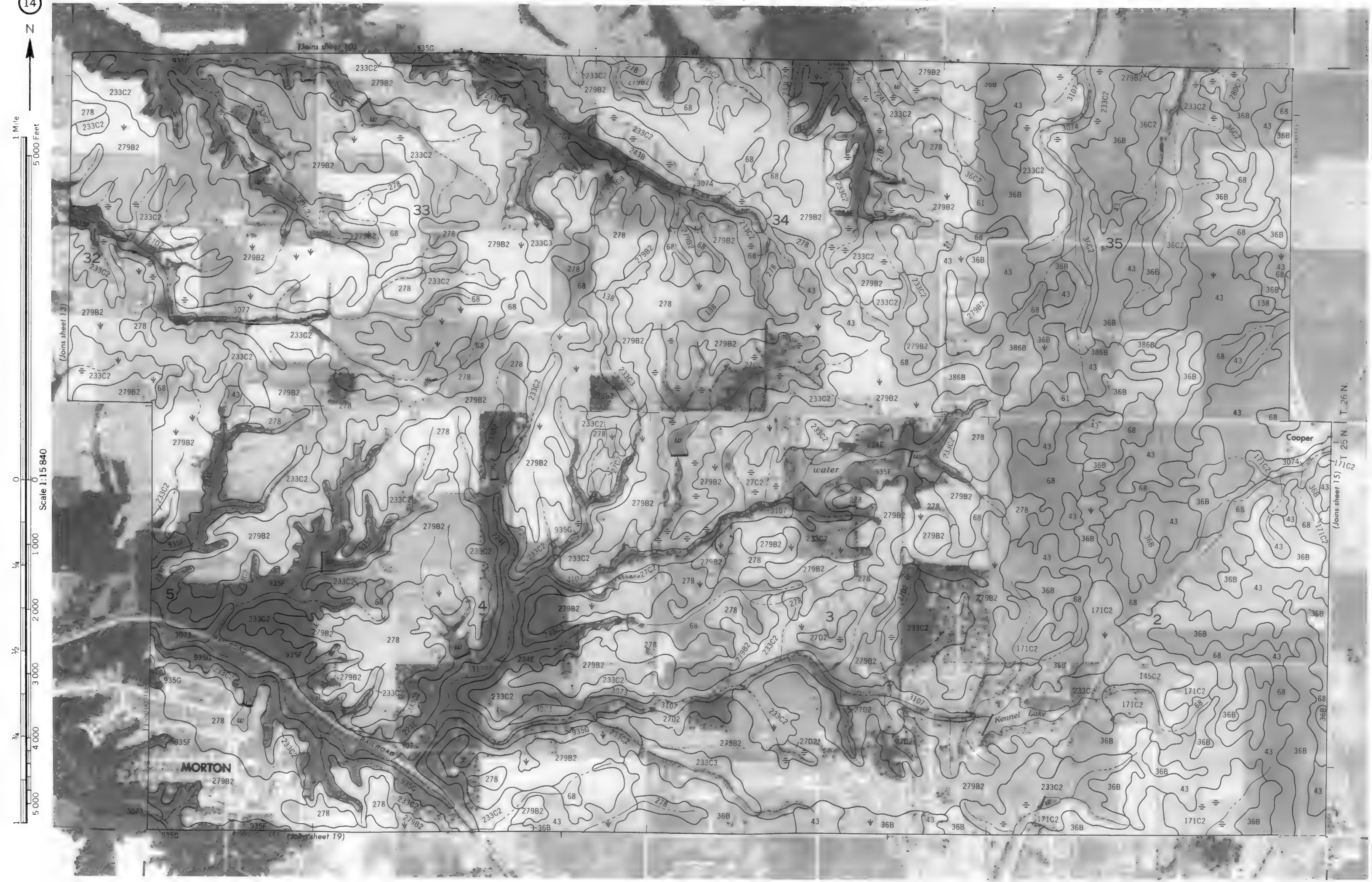

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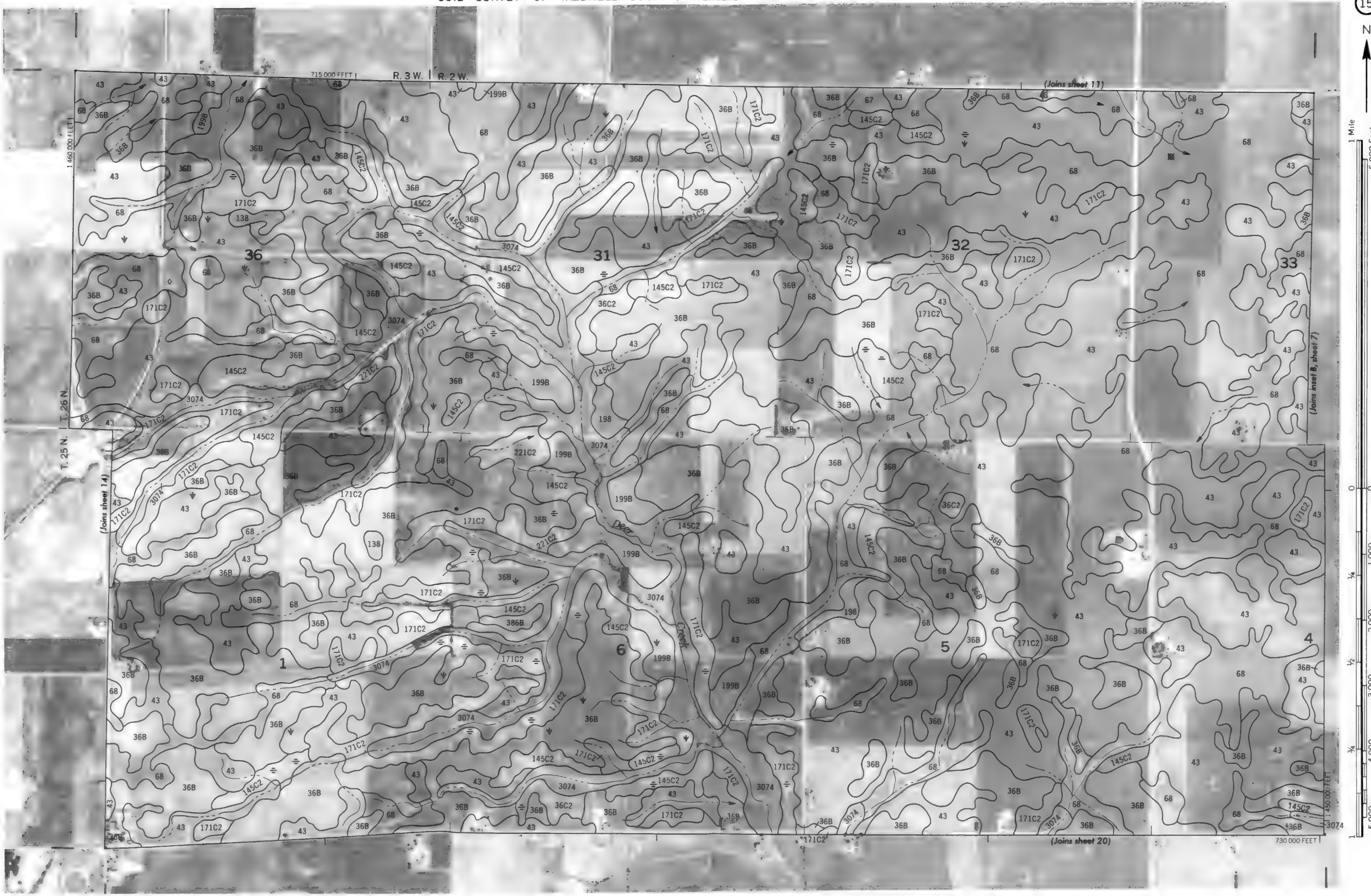
TAZEWELL COUNTY, ILLINOIS NO. 14



TAZEWELL COUNTY, ILLINOIS NO. 15

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Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

TAZEWELL COUNTY, ILLINOIS NO. 16

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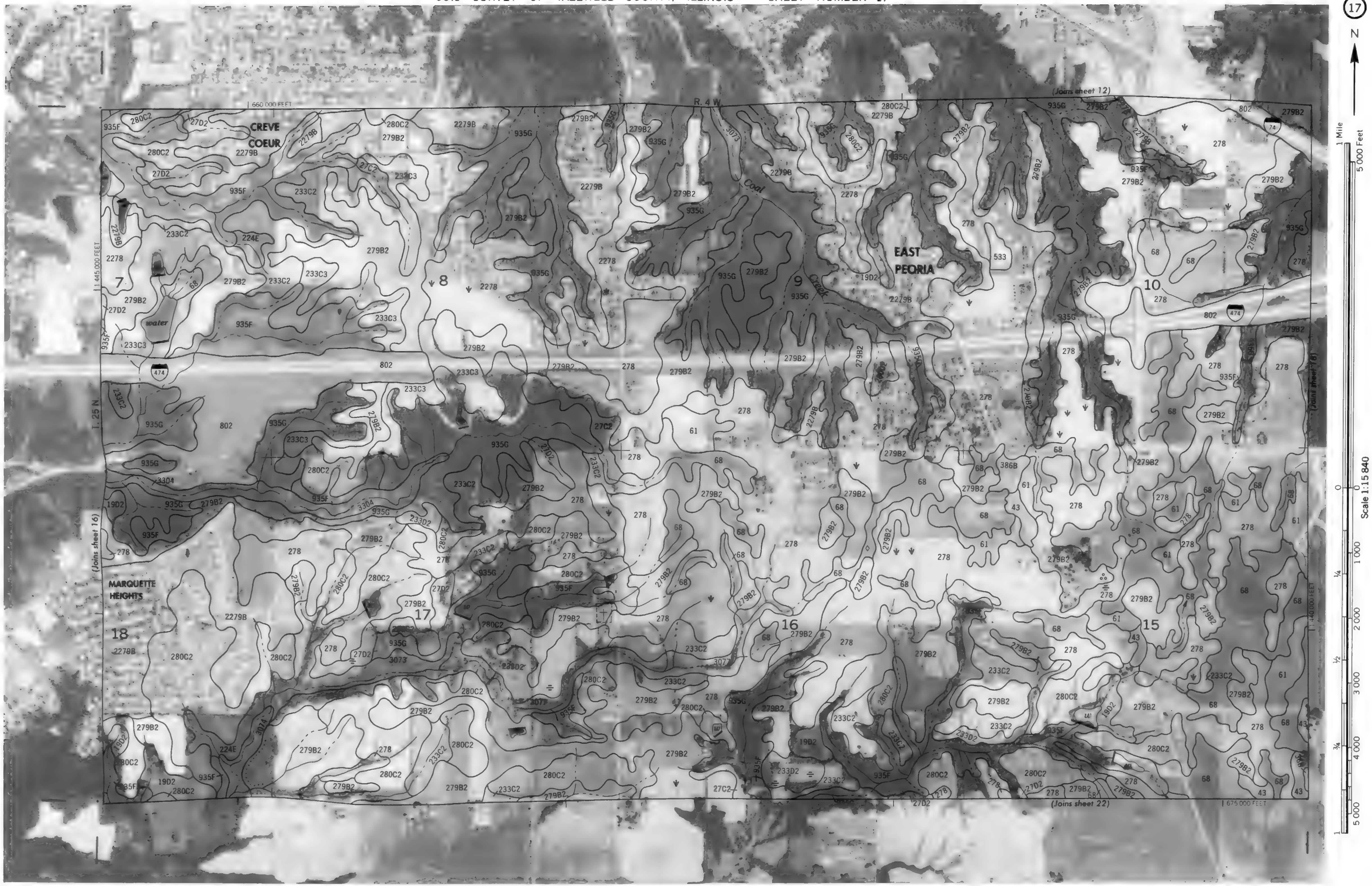

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

1 Mile

5 000 Feet

Scale 1:15 840

TAZEWELL COUNTY, ILLINOIS NO. 19

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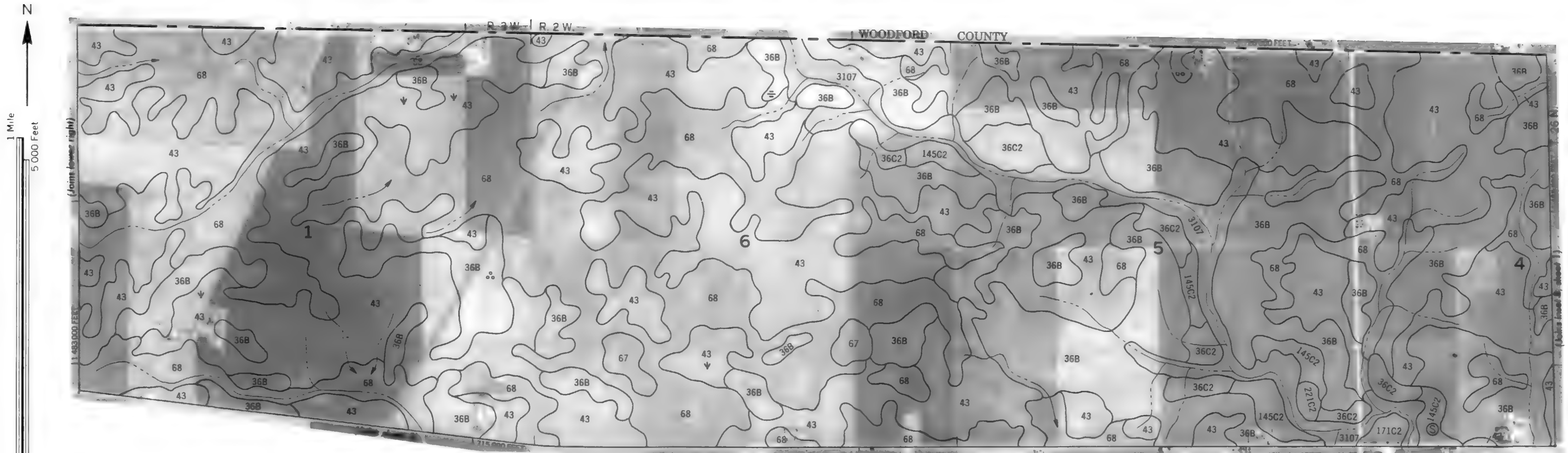
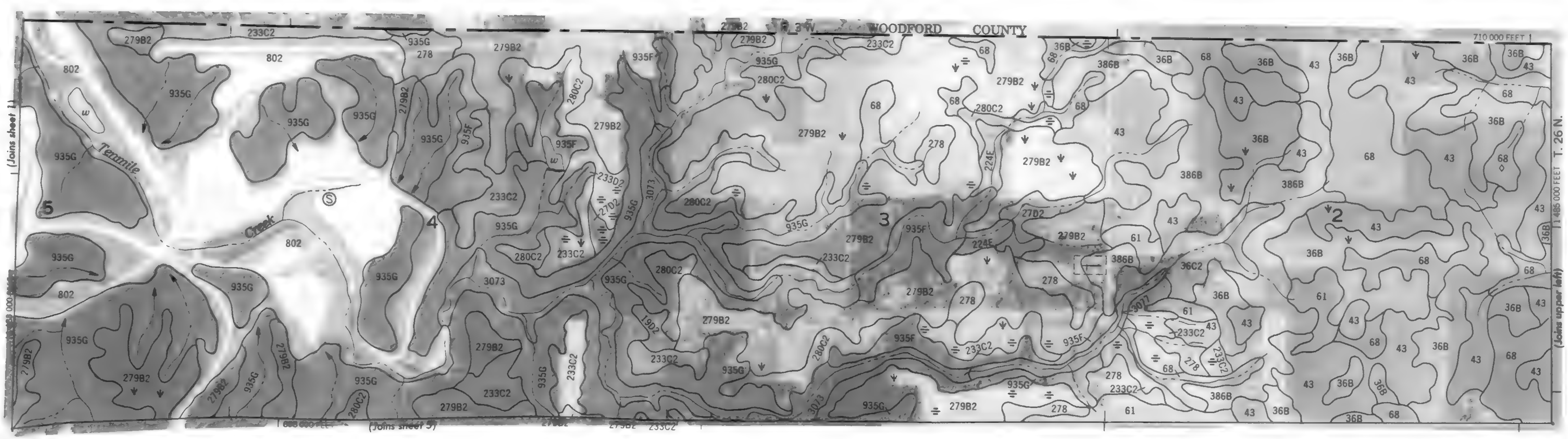


2000 AND 5000-FOOT GRID TICKS



2000 AND 5000-FOOT GRID TICKS

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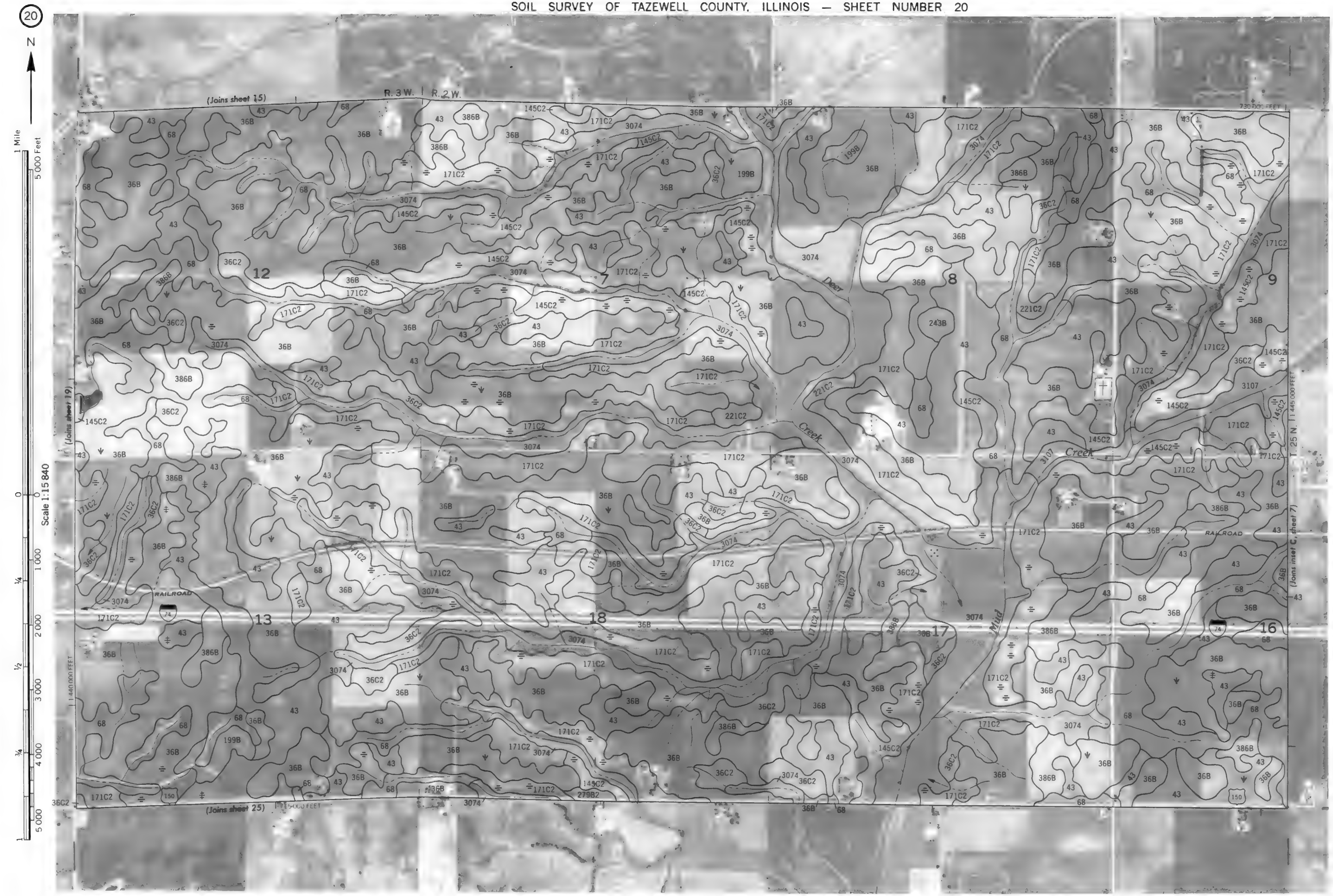

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TAZEWELL COUNTY, ILLINOIS NO. 20

TAZEWELL COUNTY, ILLINOIS NO. 21

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SOIL SURVEY OF TAZEWELL COUNTY, ILLINOIS — SHEET NUMBER 22

N

1 Mile
5 000 Feet
Scale 1:15 840
0 1 000 2 000 3 000 4 000 5 000
0 ¼ ½ ¾ 1

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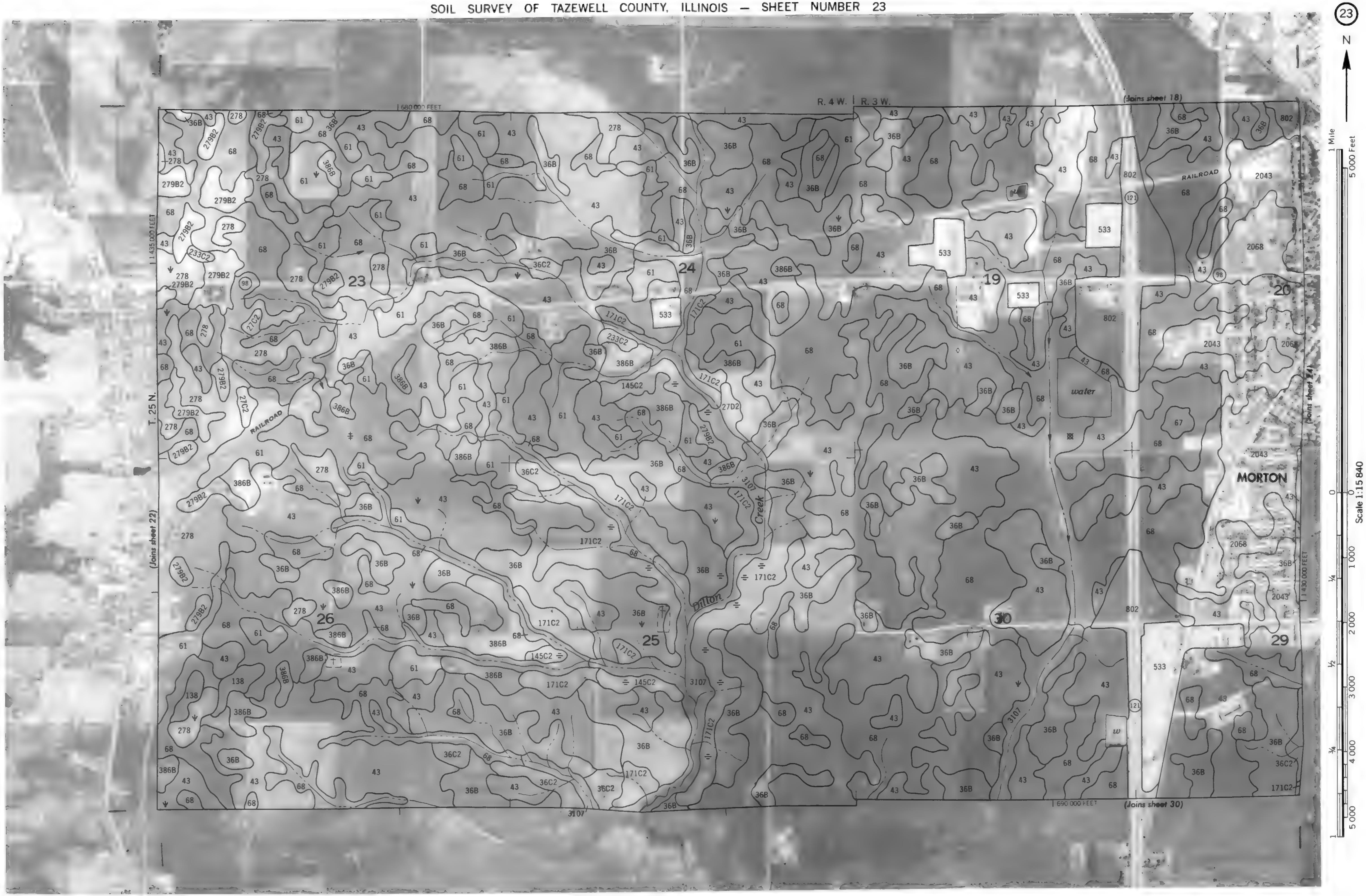
Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

TAZEWELL COUNTY, ILLINOIS NO. 22



TAZEWELL COUNTY, ILLINOIS NO. 23

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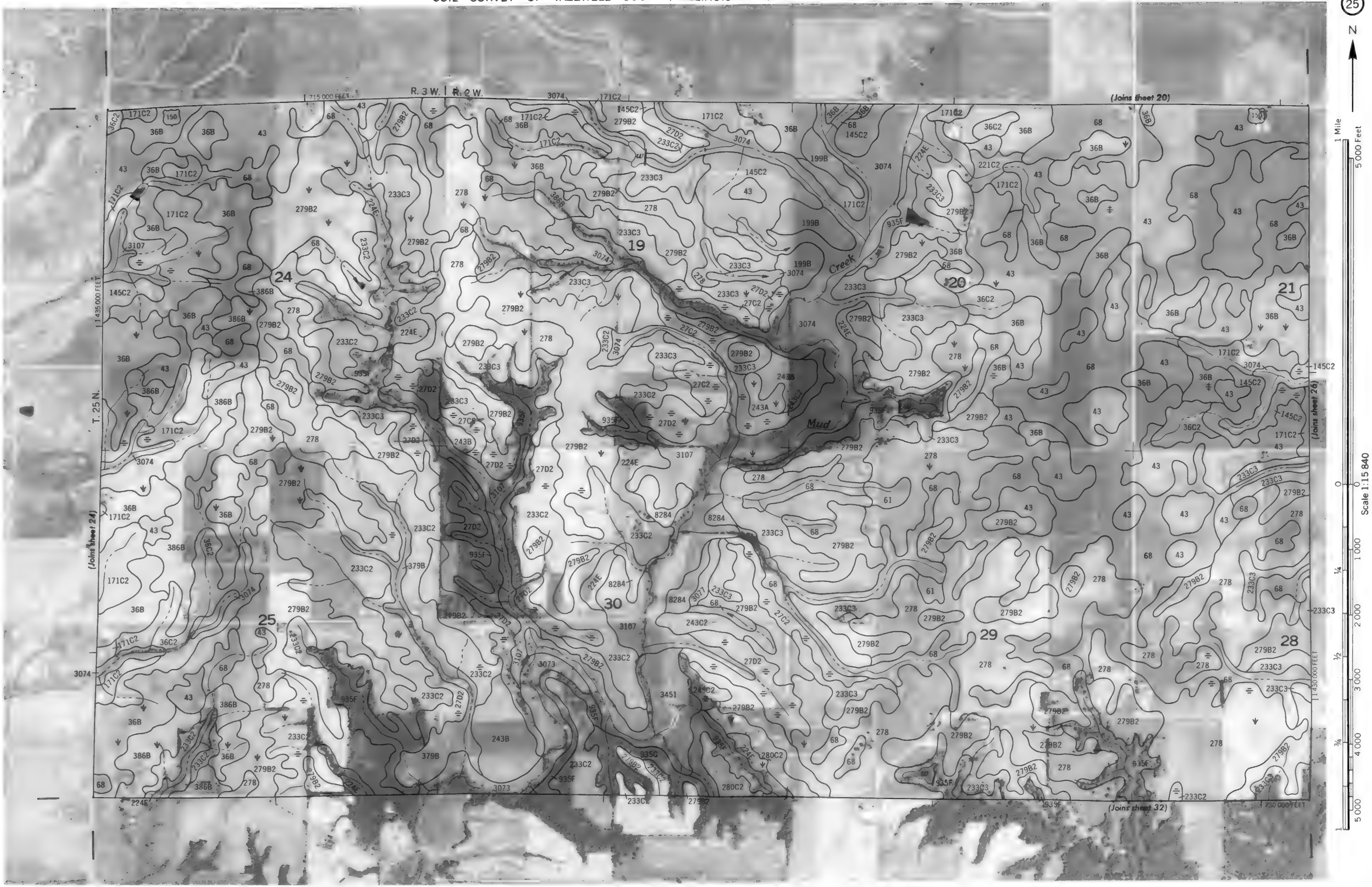
This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned



TAZEWELL COUNTY, ILLINOIS NO. 25

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

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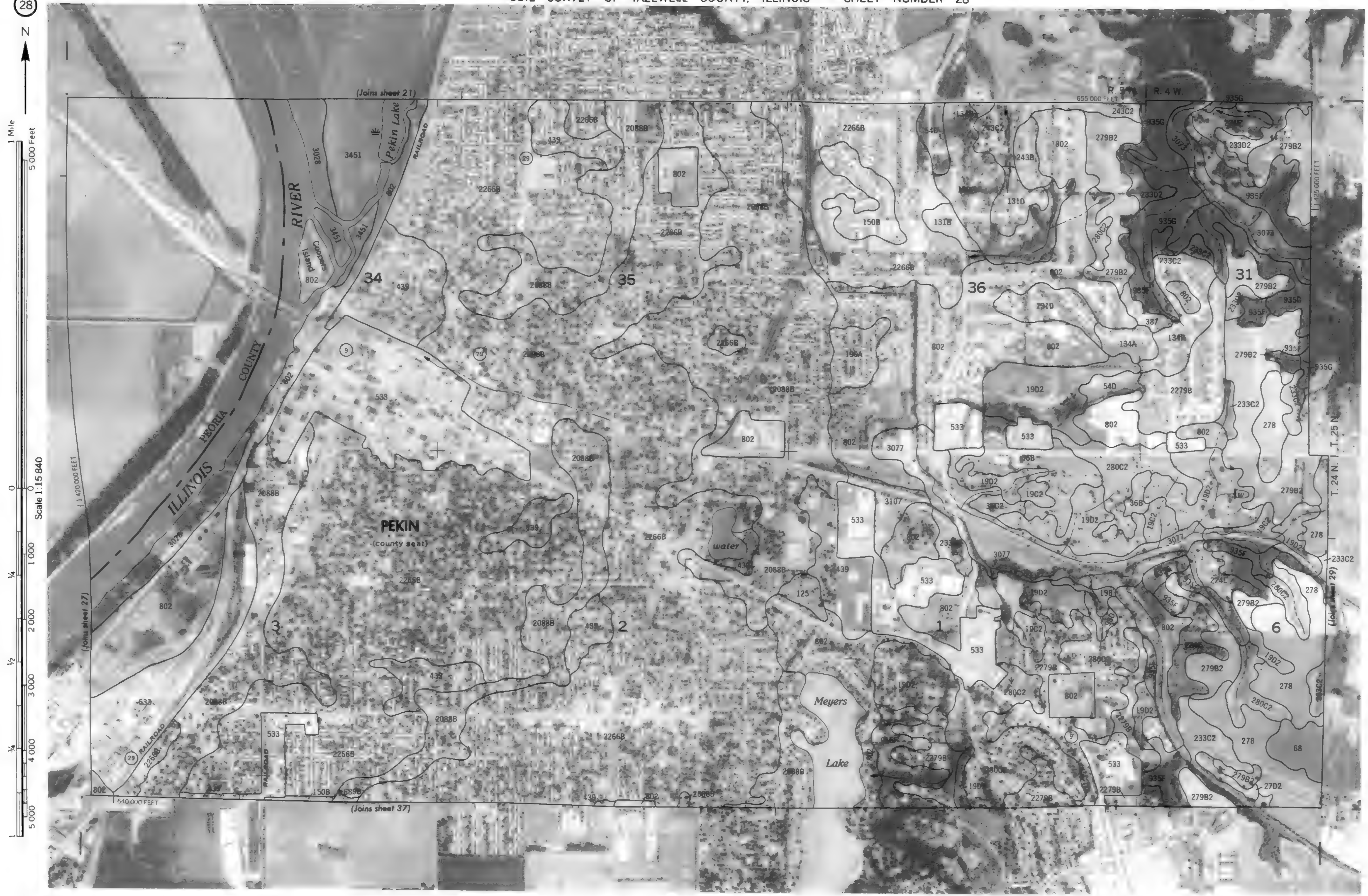
Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

TAZEWELL COUNTY, ILLINOIS NO. 27

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

SOIL SURVEY OF TAZEWELL COUNTY, ILLINOIS — SHEET NUMBER 28



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

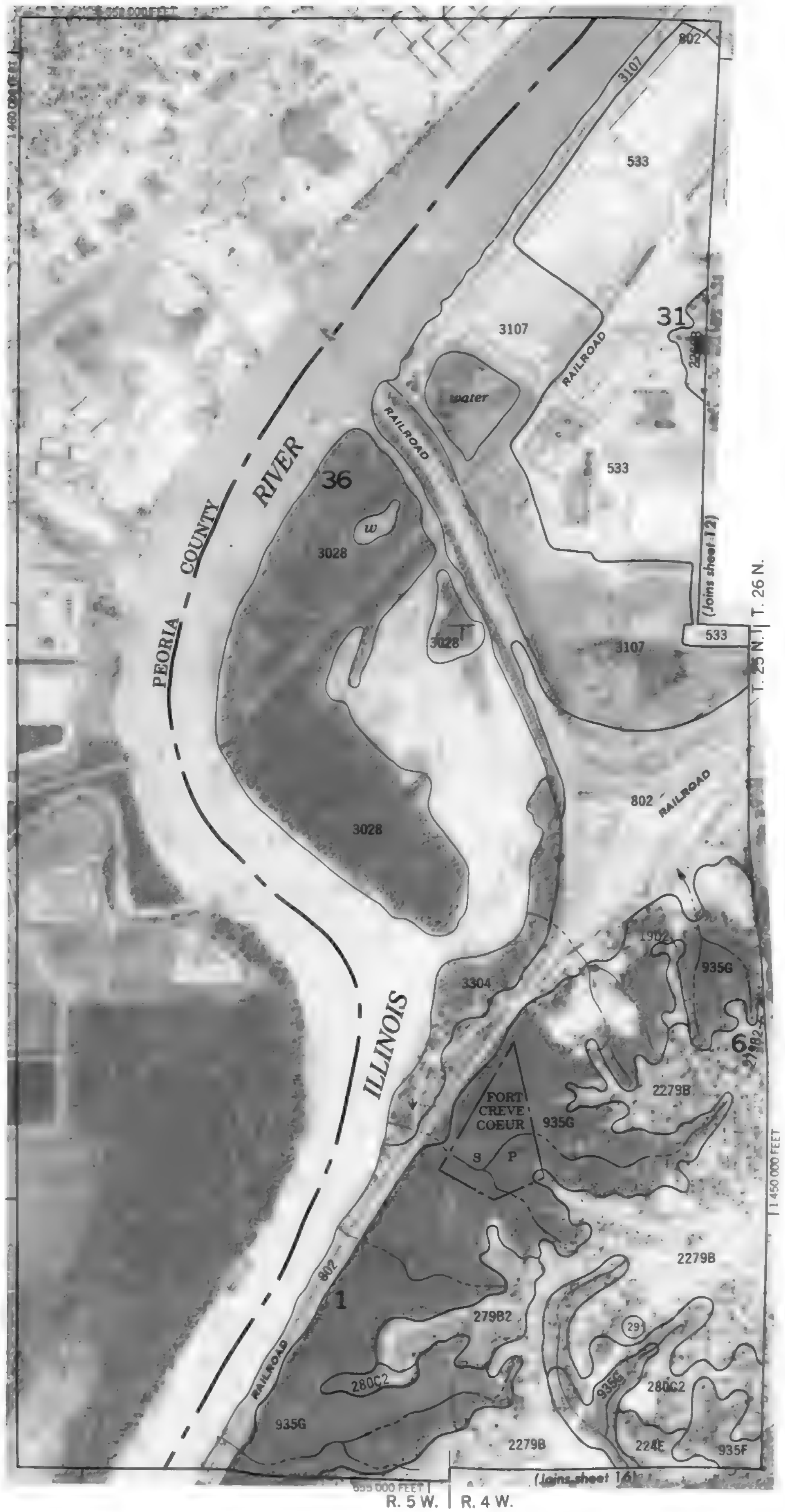
TAZEWELL COUNTY, ILLINOIS NO. 28

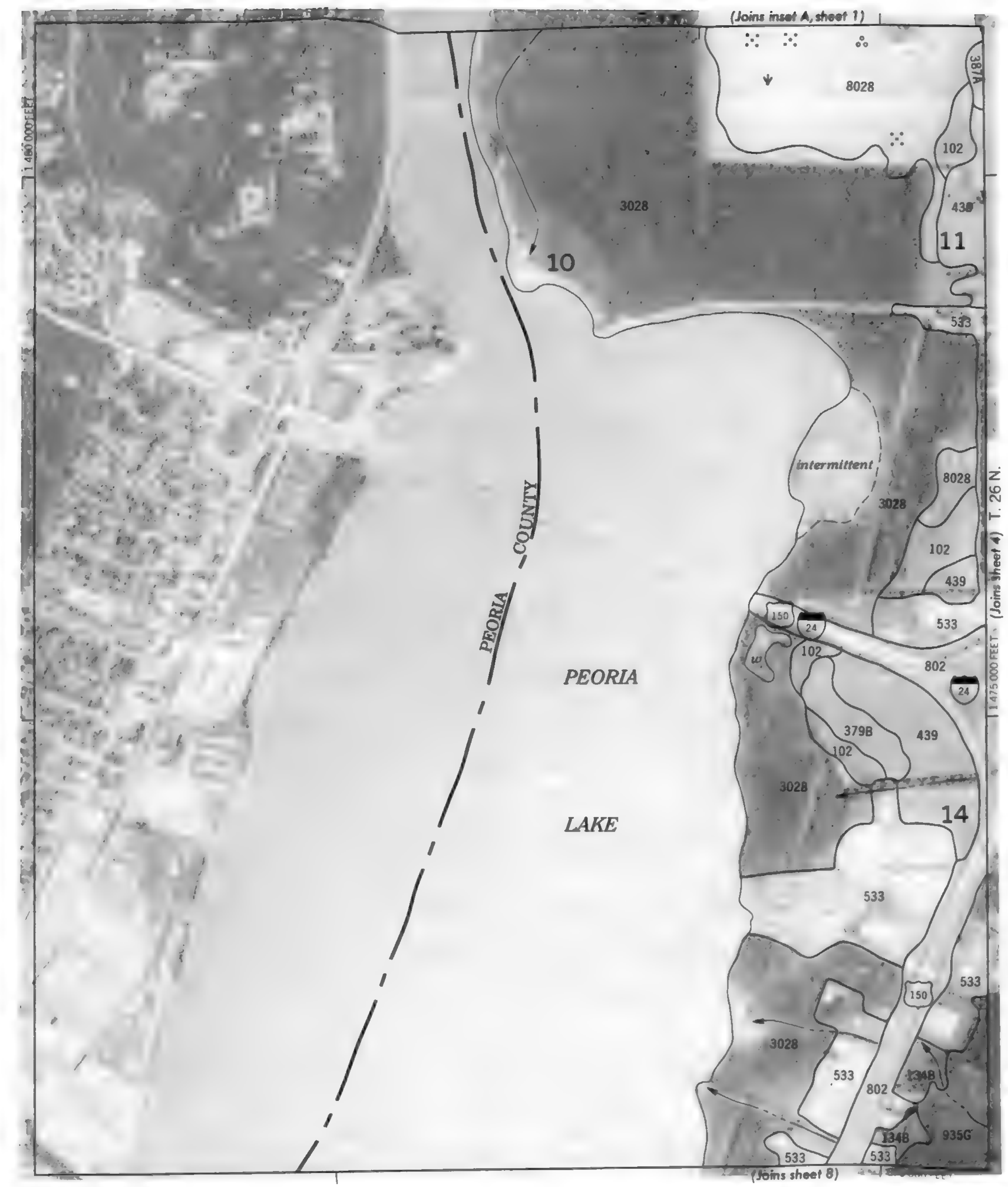
TAZEWELL COUNTY, ILLINOIS NO. 29

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

TAZEWELL COUNTY, ILLINOIS NO. 3

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.





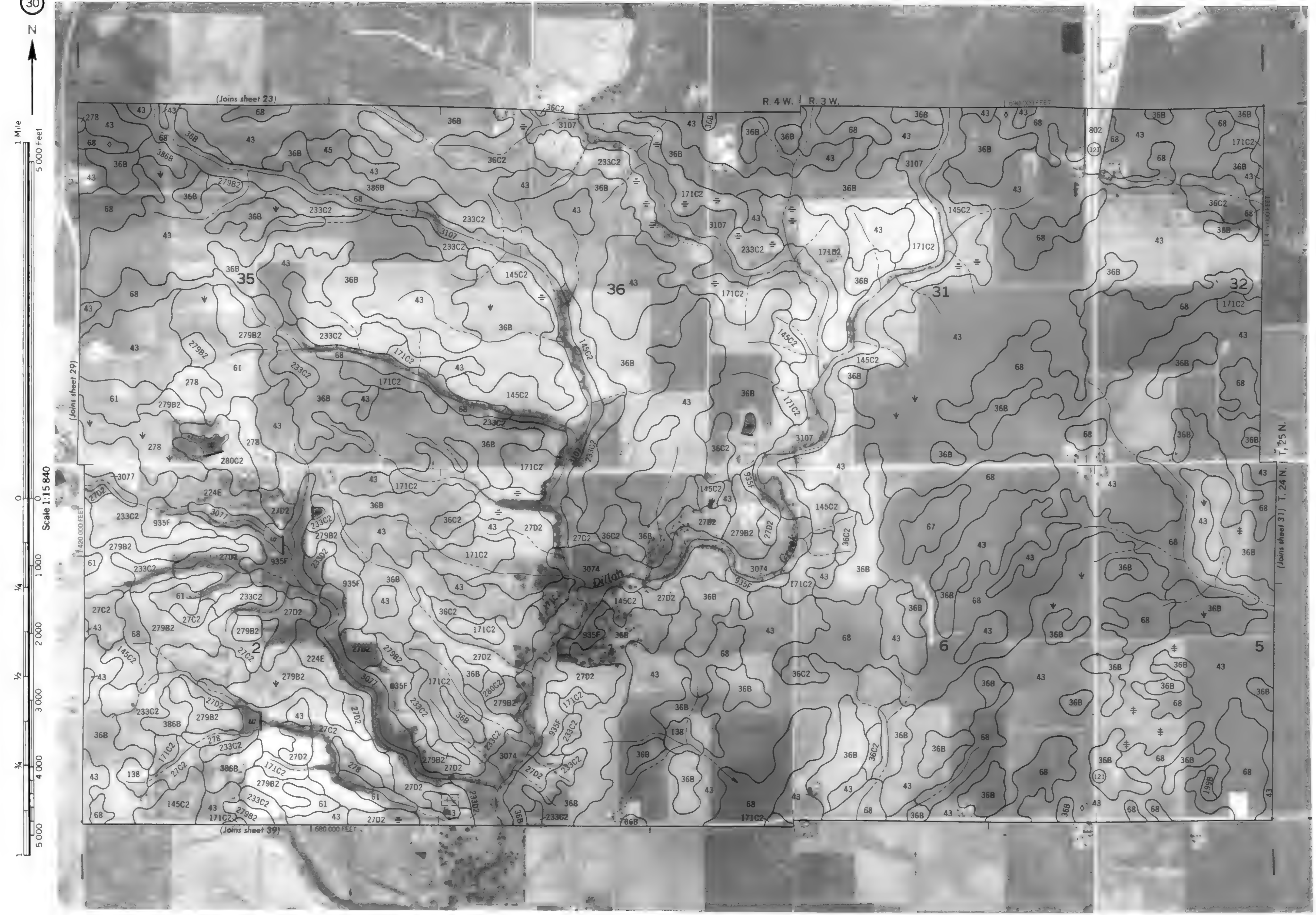
N

Scale 1:15 840

1 Mile

5 000 Feet

SOIL SURVEY OF TAZEWELL COUNTY, ILLINOIS — SHEET NUMBER 30

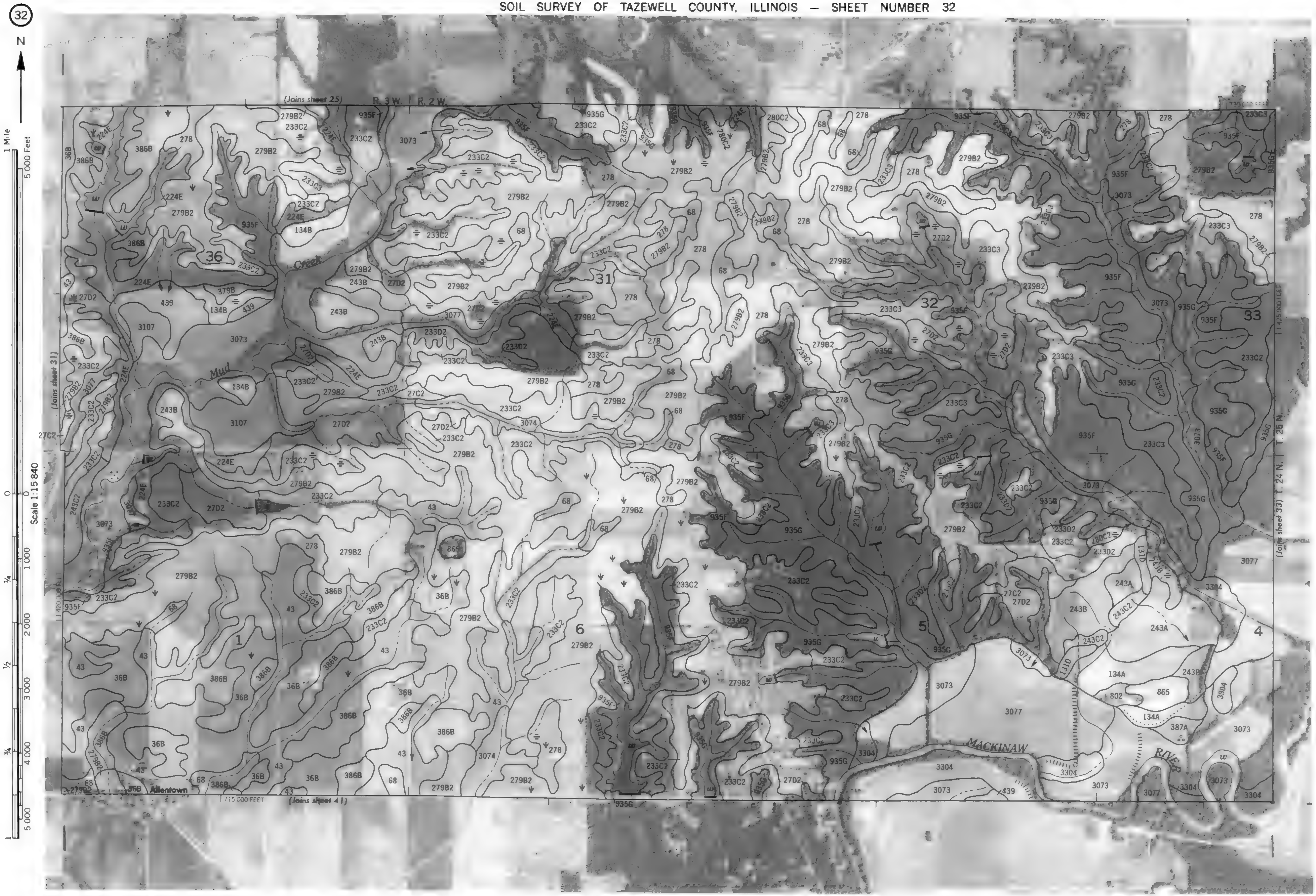


This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

TAZEWELL COUNTY, ILLINOIS NO. 30

TAZEWELL COUNTY, ILLINOIS NO. 31

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

TAZEWELL COUNTY, ILLINOIS NO. 33
This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
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TAZEWELL COUNTY, ILLINOIS NO. 35

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

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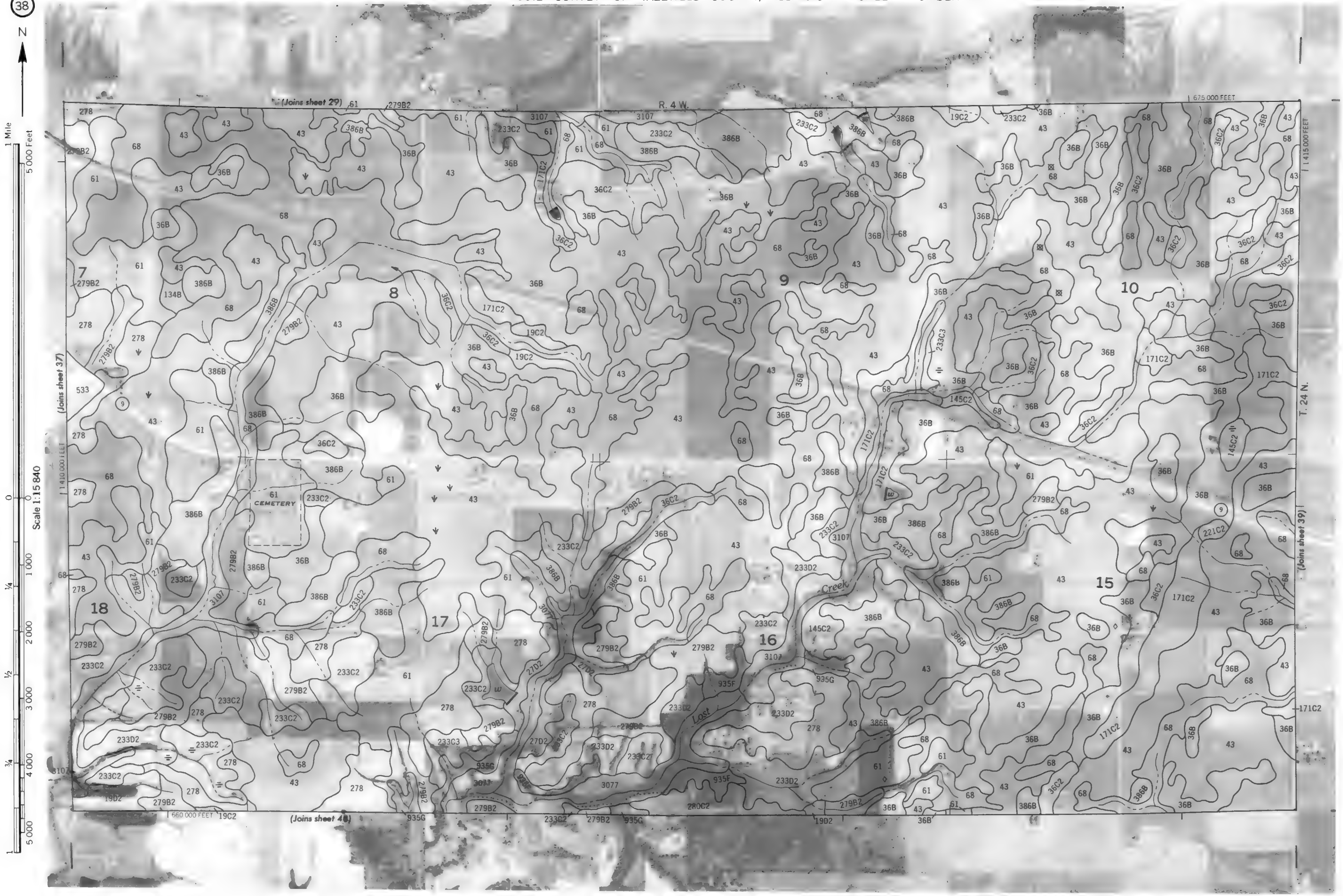
TAZEWELL COUNTY, ILLINOIS NO. 37

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

39

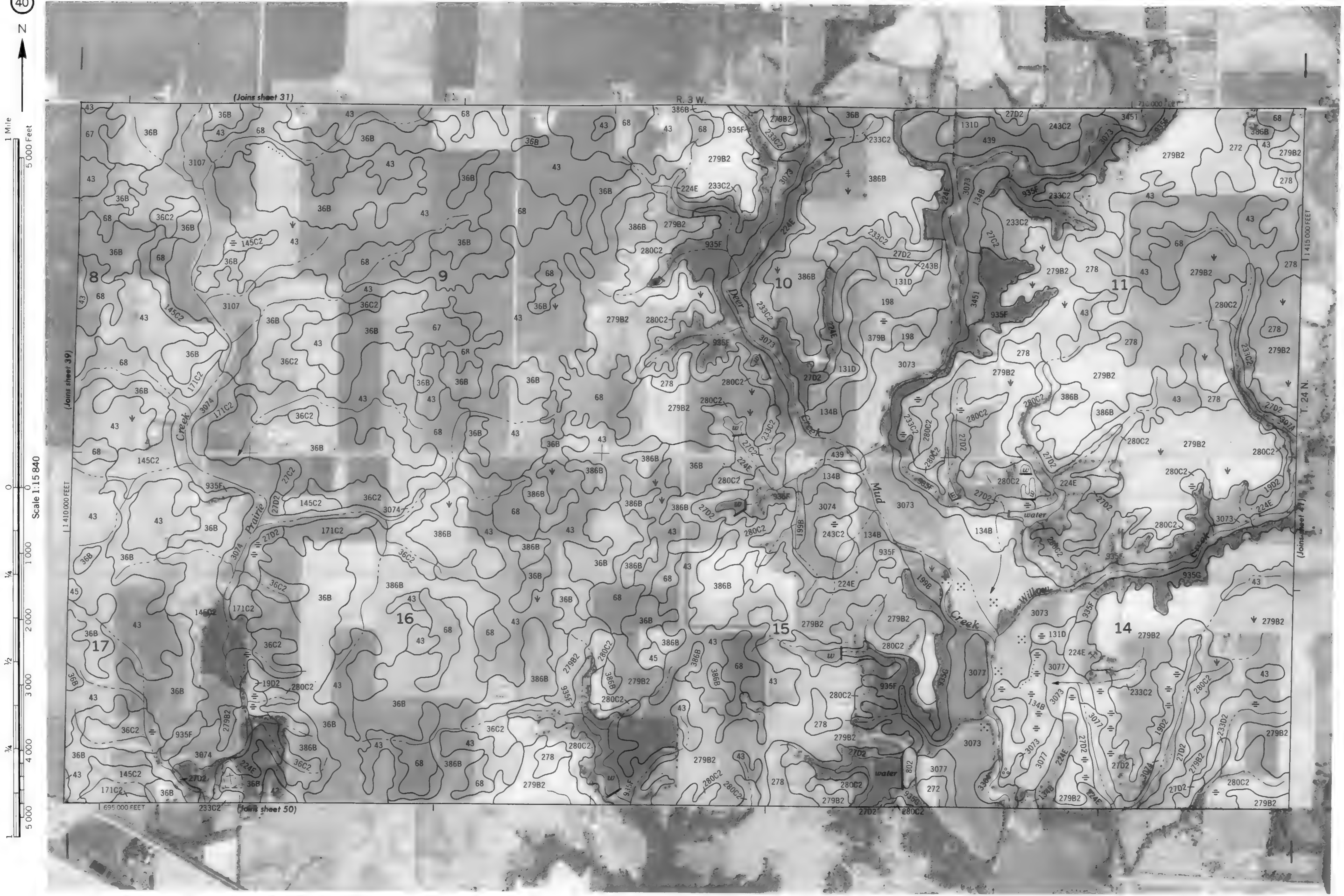
N

1 Mile
5 000 Feet
0
1 000
2 000
3 000
4 000
5 000
¼
½
¾
1

Scale 1:15 840

TAZEWELL COUNTY, ILLINOIS NO. 39

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

TAZEWELL COUNTY, ILLINOIS NO. 40

41

TAZEWELL COUNTY, ILLINOIS NO. 41

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

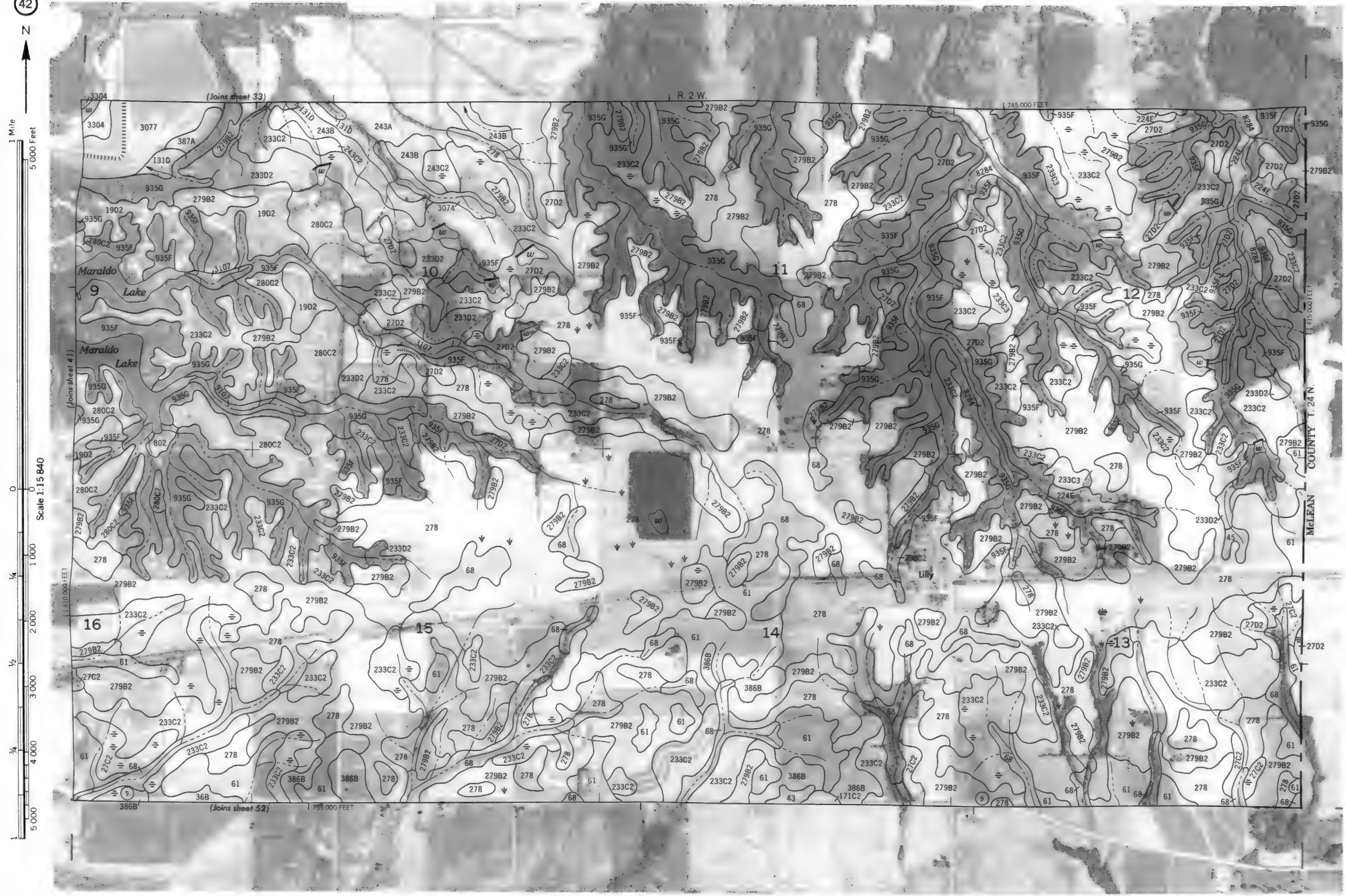
N

1 Mile

5 000 Feet

Scale 1:15 840

SOIL SURVEY OF TAZEWELL COUNTY, ILLINOIS — SHEET NUMBER 42



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned

TAZEWELL COUNTY, ILLINOIS NO. 43

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
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TAZEWELL COUNTY, ILLINOIS NO. 44

SOIL SURVEY OF TAZEWELL COUNTY, ILLINOIS — SHEET NUMBER 45

TAZEWELL COUNTY, ILLINOIS NO. 45

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

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Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

TAZEWELL COUNTY, ILLINOIS NO. 46

TAZEWELL COUNTY, ILLINOIS NO. 47

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

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Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

TAZEWELL COUNTY, ILLINOIS NO. 49

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

TAZEWELL COUNTY, ILLINOIS NO. 5

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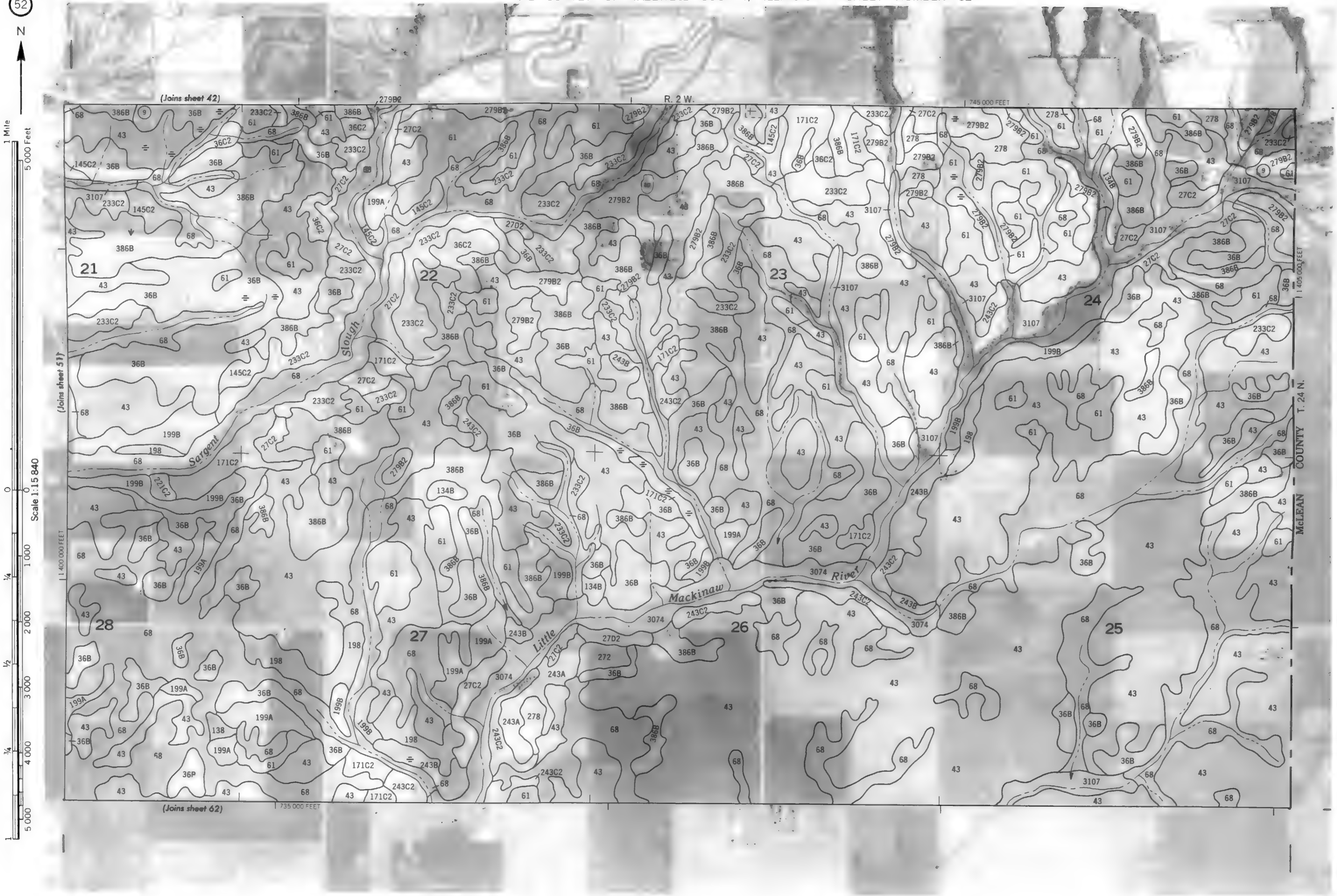
Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

TAZEWELL COUNTY, ILLINOIS NO. 51

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

TAZEWELL COUNTY, ILLINOIS NO. 52

TAZEWELL COUNTY, ILLINOIS NO. 53

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

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TAZEWELL COUNTY, ILLINOIS NO. 54

TAZEWELL COUNTY, ILLINOIS NO. 55

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Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

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Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned

TAZEWELL COUNTY, ILLINOIS NO. 56

TAZEWELL COUNTY, ILLINOIS NO. 57

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Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

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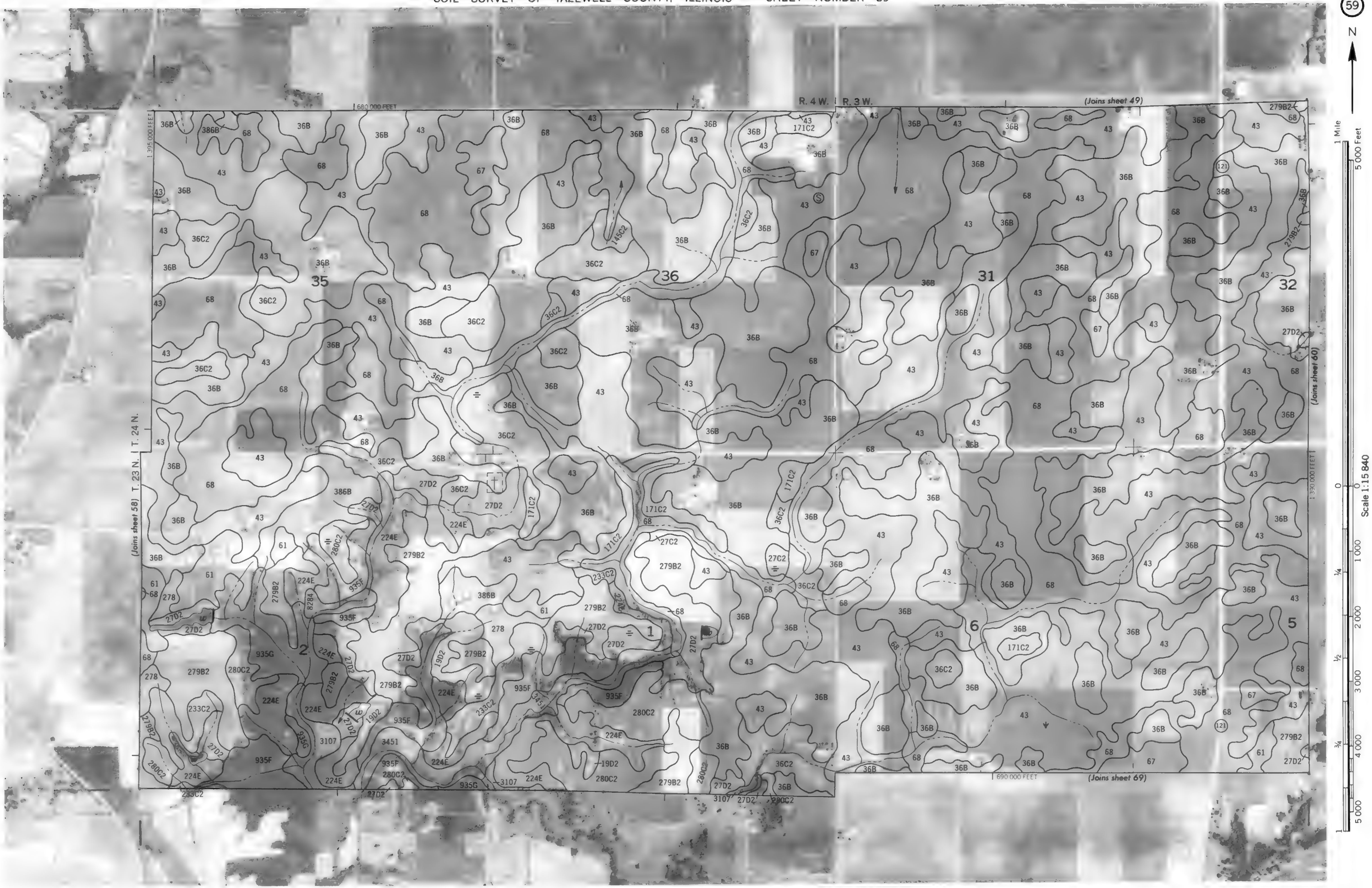
Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



TAZEWELL COUNTY, ILLINOIS NO. 59

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

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Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

TAZEWELL COUNTY, ILLINOIS NO. 6

SOIL SURVEY OF TAZEWELL COUNTY, ILLINOIS — SHEET NUMBER 60

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

TAZEWELL COUNTY, ILLINOIS NO. 60

TAZEWELL COUNTY, ILLINOIS NO. 61

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Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

63

TAZEWELL COUNTY, ILLINOIS NO. 63

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

SOIL SURVEY OF TAZEWELL COUNTY, ILLINOIS — SHEET NUMBER 64

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

TAZEWELL COUNTY, ILLINOIS NO. 64

TAZEWELL COUNTY, ILLINOIS NO. 65

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

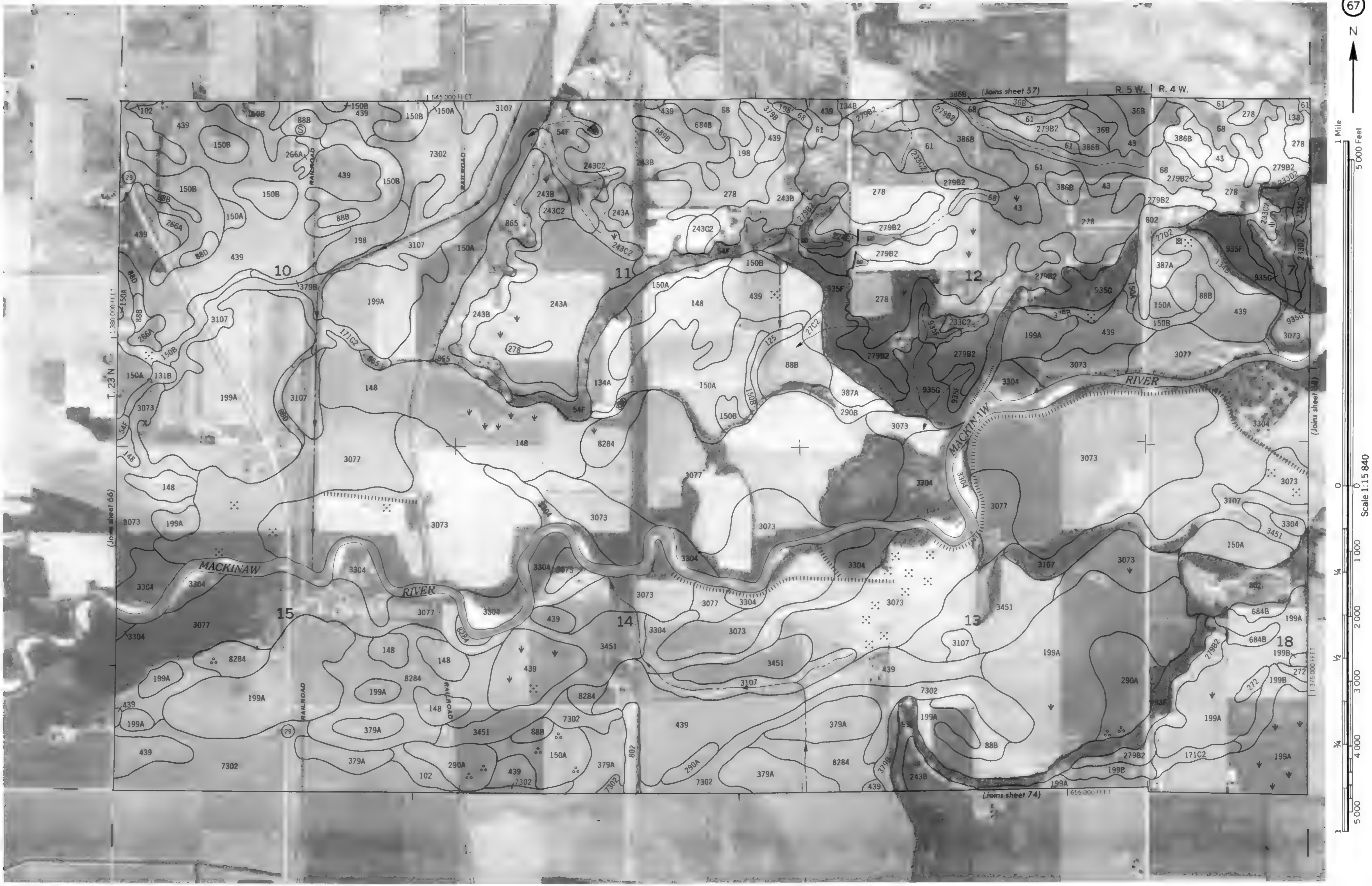
SOIL SURVEY OF TAZEWELL COUNTY, ILLINOIS — SHEET NUMBER 66

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

TAZEWELL COUNTY, ILLINOIS NO. 66

TAZEWELL COUNTY, ILLINOIS NO. 67

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



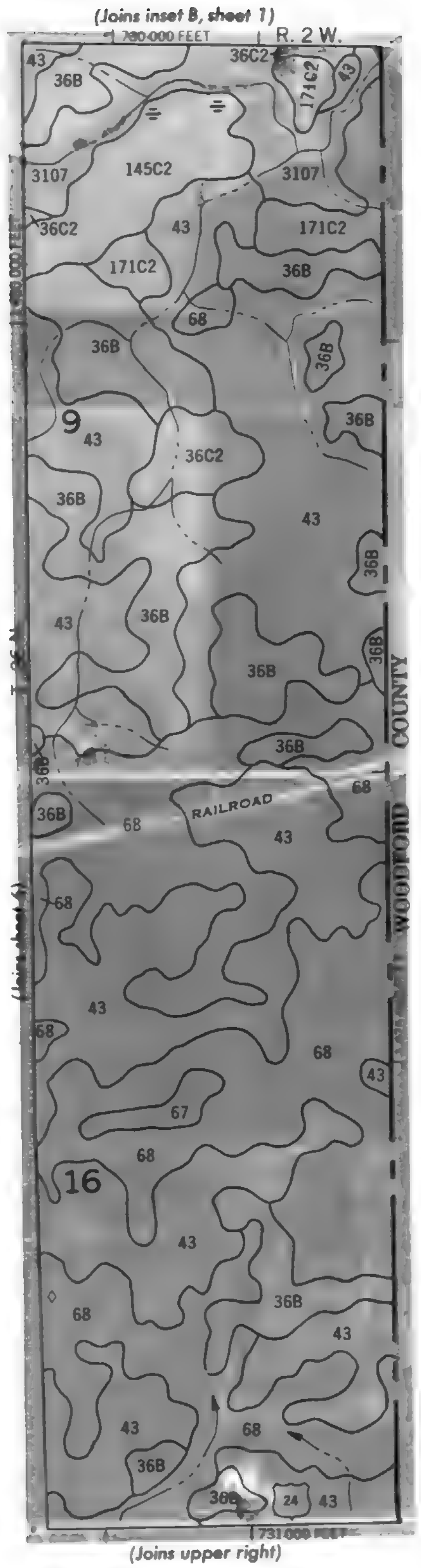
This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

TAZEWELL COUNTY, ILLINOIS NO. 69

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

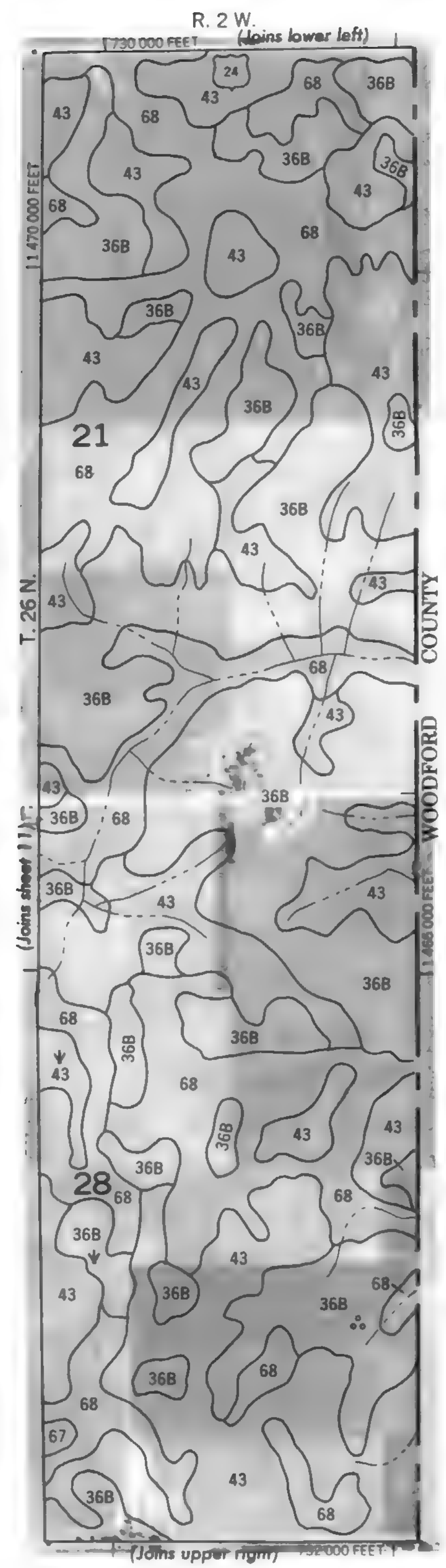
TAZEWELL COUNTY, ILLINOIS NO. 7

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



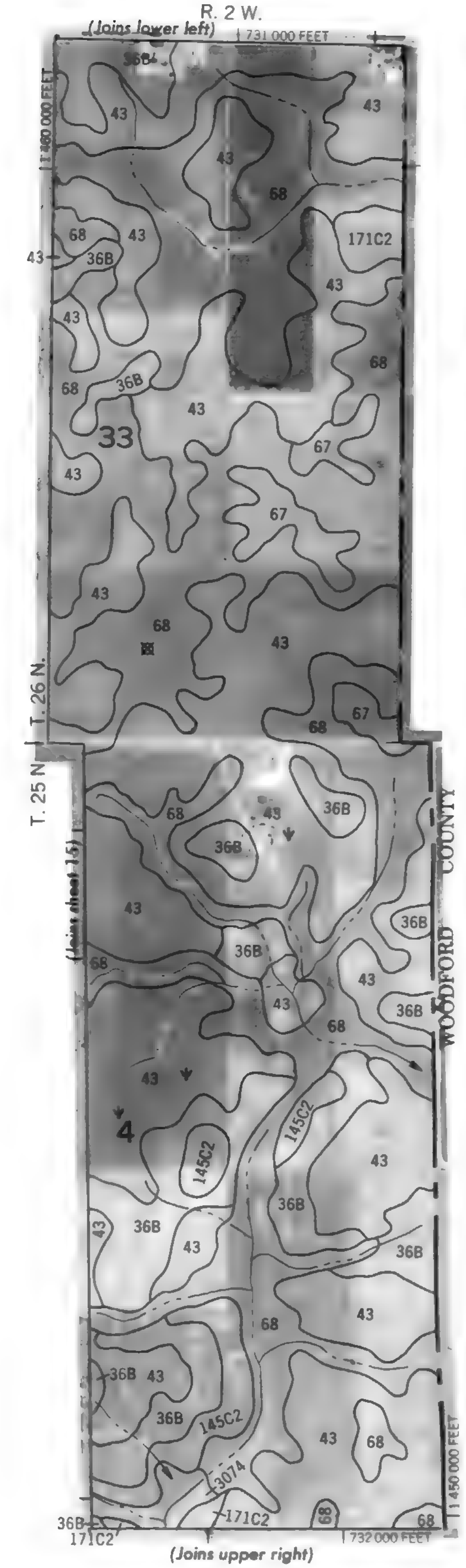
1000 AND 5000-FOOT GRID TICKS

INSET A



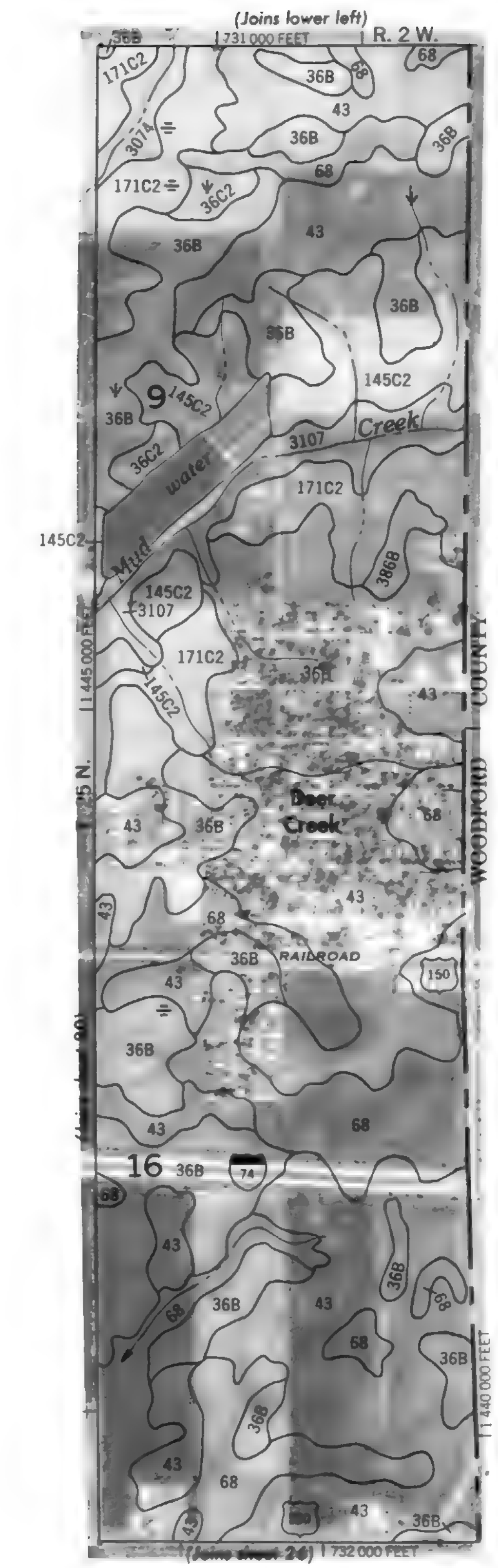
2000 AND 5000-FOOT GRID TICKS

INSET B



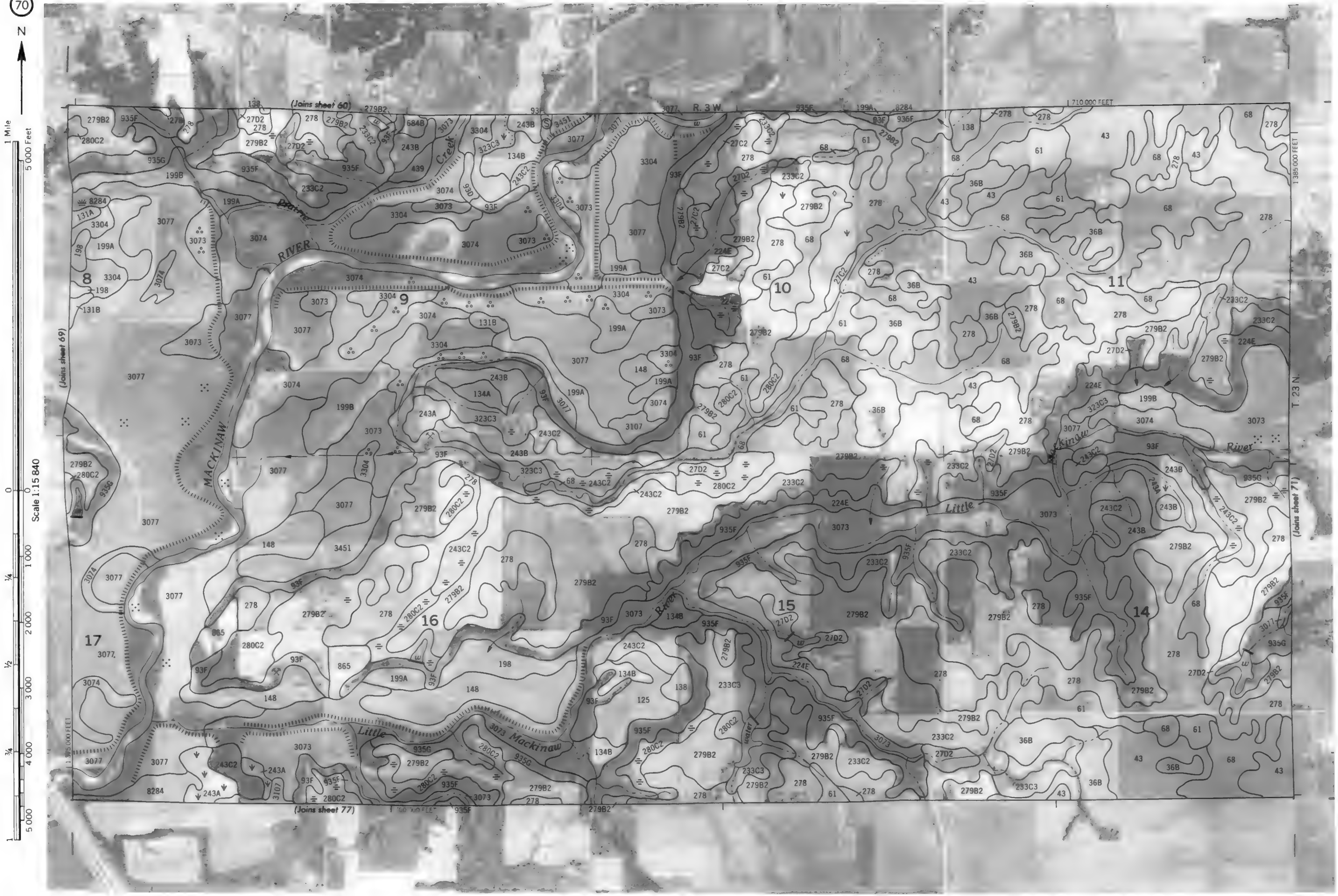
1000 AND 5000-FOOT GRID TICKS

INSET C



1000 AND 5000-FOOT GRID TICKS

SOIL SURVEY OF TAZEWELL COUNTY, ILLINOIS — SHEET NUMBER 70



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

Scale 1:15 840

1 Mile

5 000 Feet

0 ¼ ½ ¾ 1

0 1000 2000 3000 4000 5000

TAZEWELL COUNTY, ILLINOIS NO. 71

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
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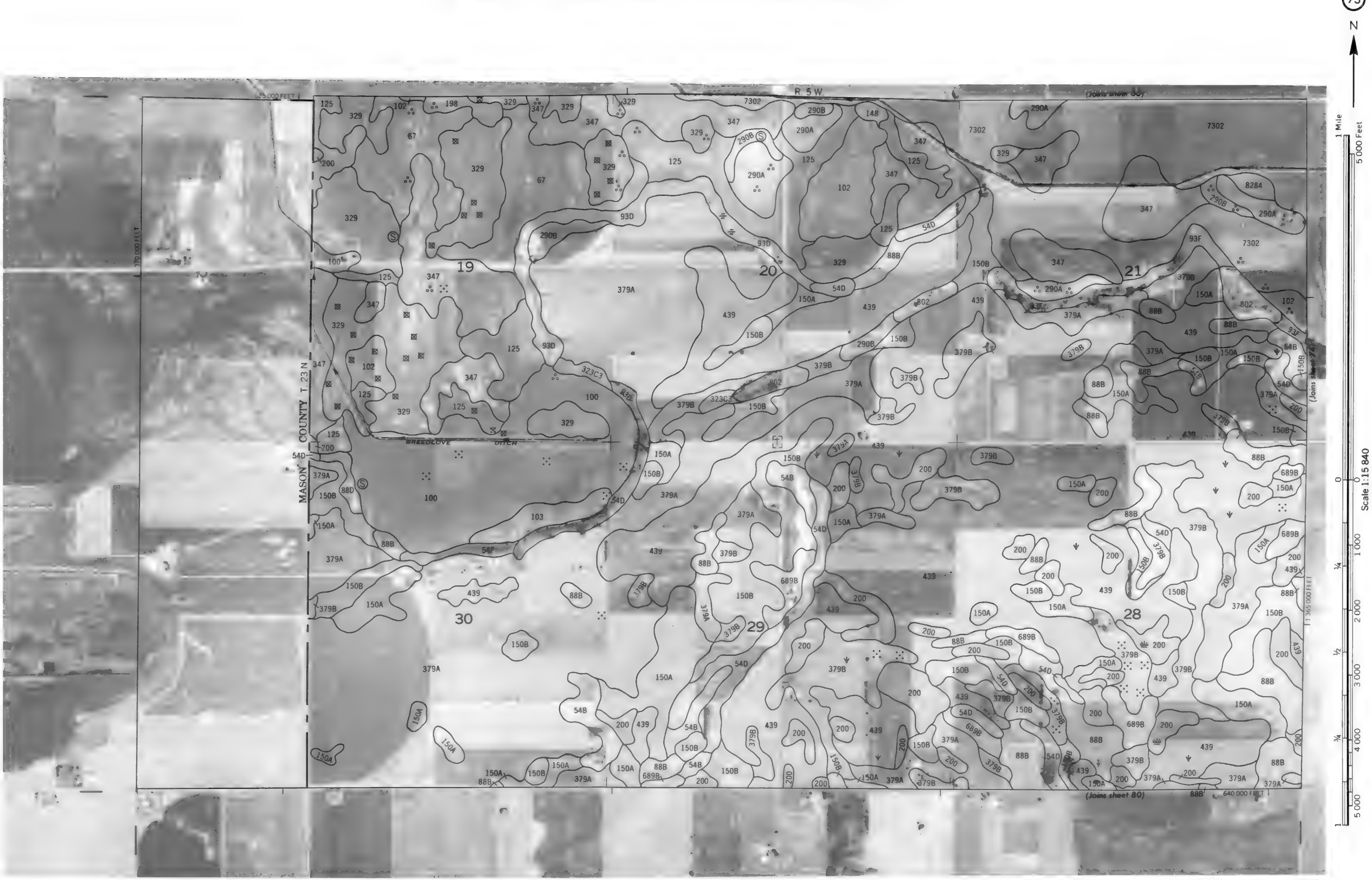
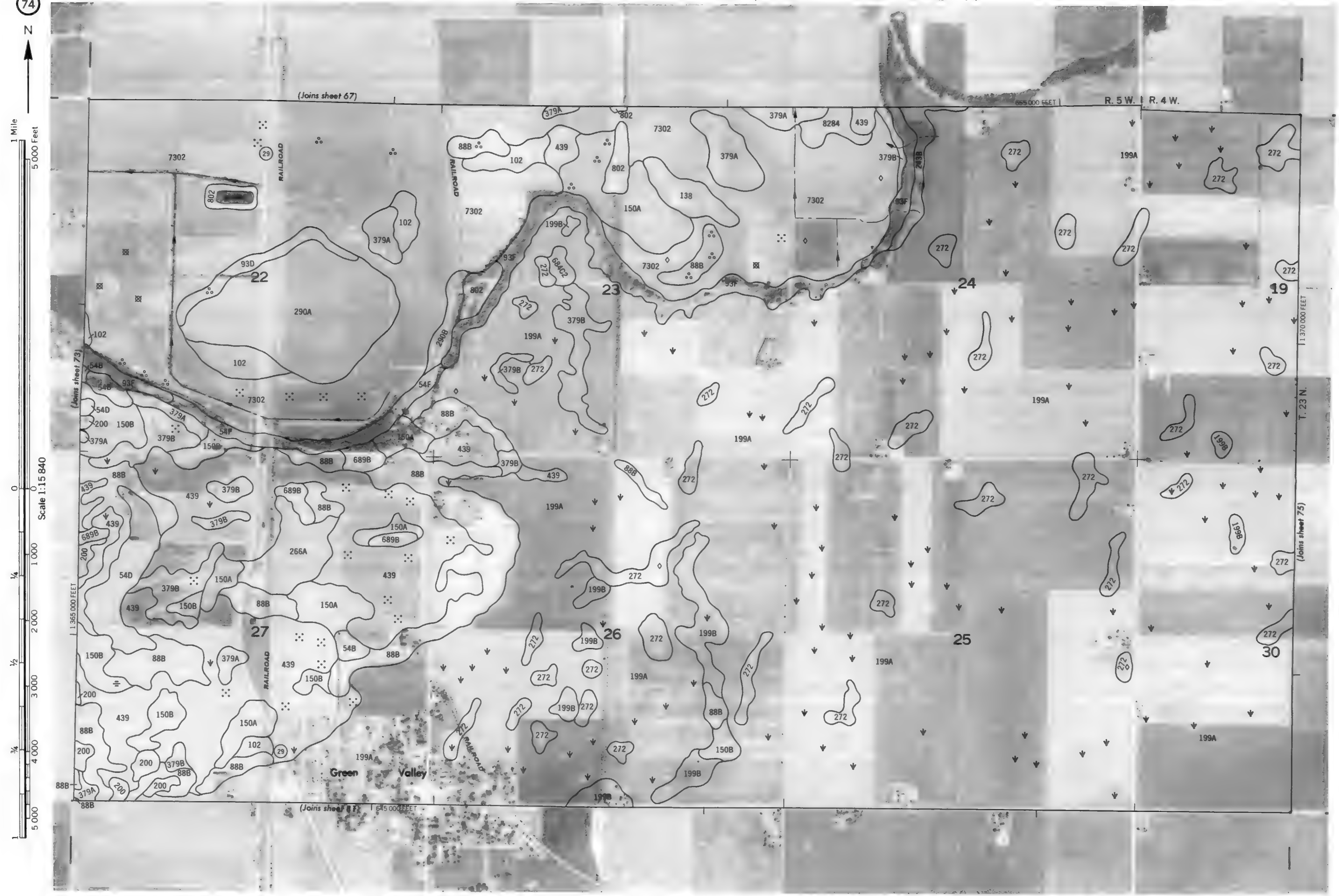
Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

TAZEWELL COUNTY, ILLINOIS NO. 72



TAZEWELL COUNTY, ILLINOIS NO. 73

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
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TAZEWELL COUNTY, ILLINOIS NO. 74

TAZEWELL COUNTY, ILLINOIS NO. 75

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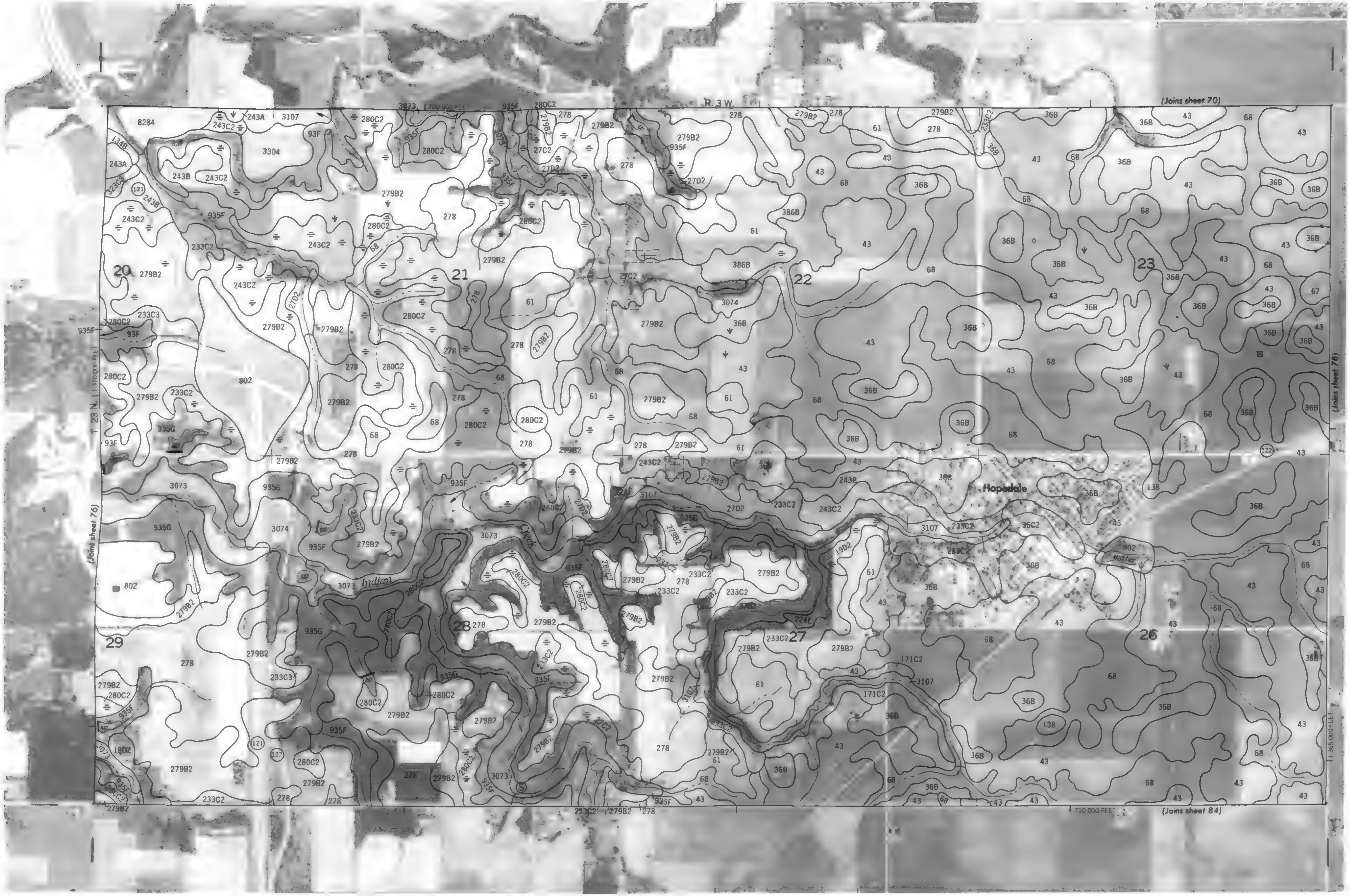
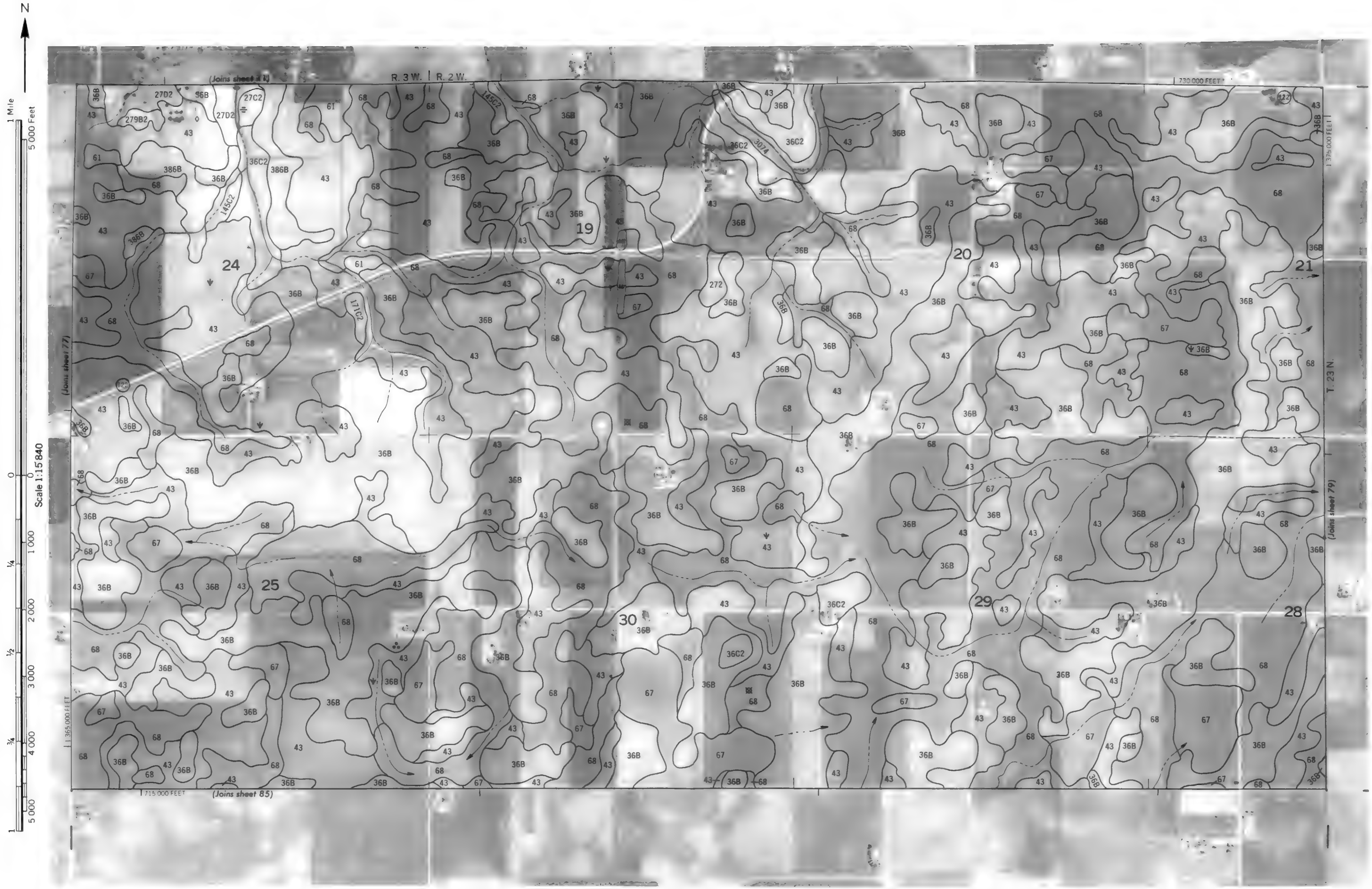
Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



TAZEWELL COUNTY, ILLINOIS NO. 77

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

SOIL SURVEY OF TAZEWELL COUNTY, ILLINOIS — SHEET NUMBER 78



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

TAZEWELL COUNTY, ILLINOIS NO. 78

TAZEWELL COUNTY, ILLINOIS NO. 79

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

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Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned

N

1 Mile

5 000 Feet

Scale 1:15 840

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

TAZEWELL COUNTY, ILLINOIS NO. 80

TAZEWELL COUNTY, ILLINOIS NO. 81

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Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

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Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

TAZEWELL COUNTY, ILLINOIS NO. 82

TAZEWELL COUNTY, ILLINOIS NO. 83

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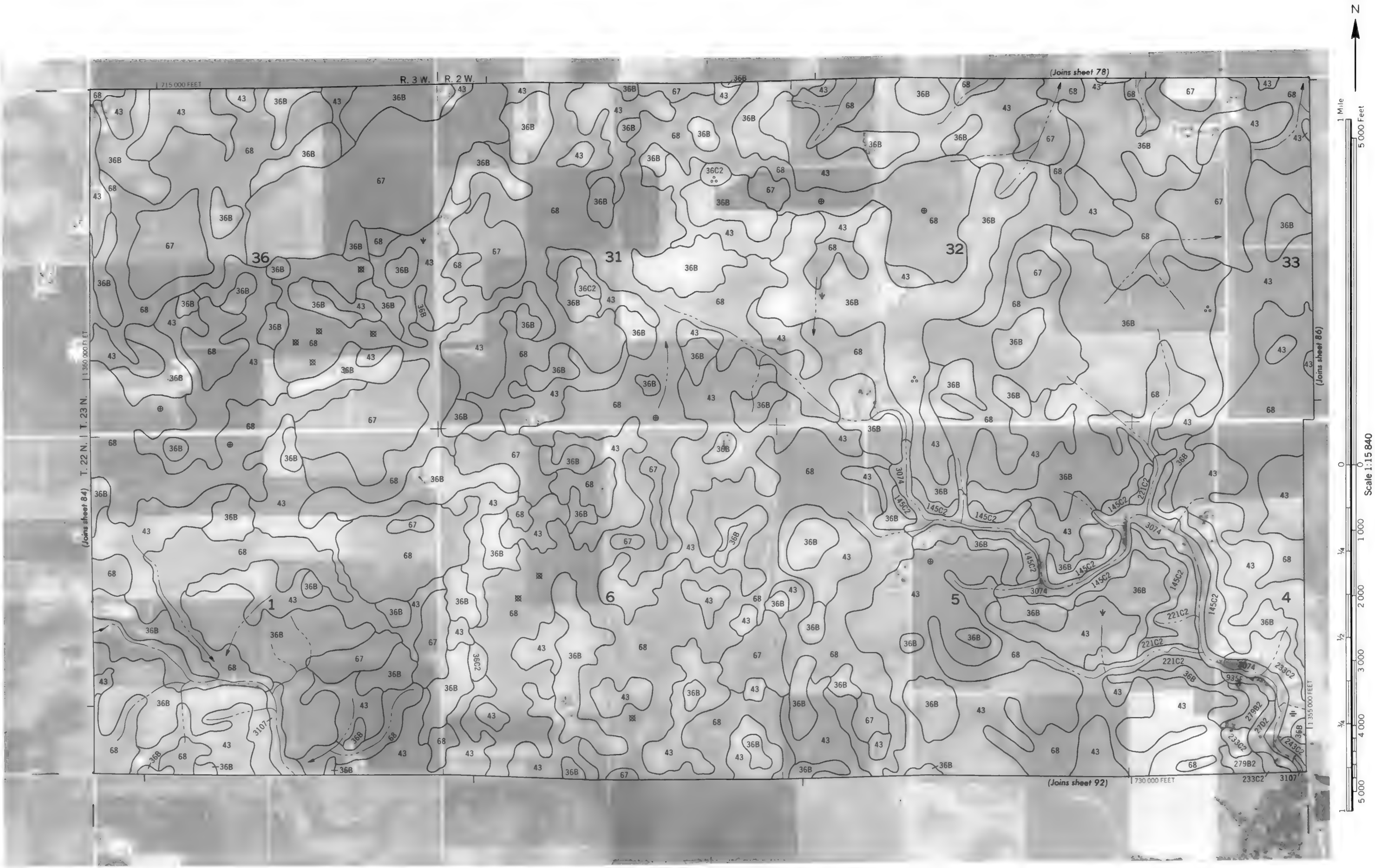
Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

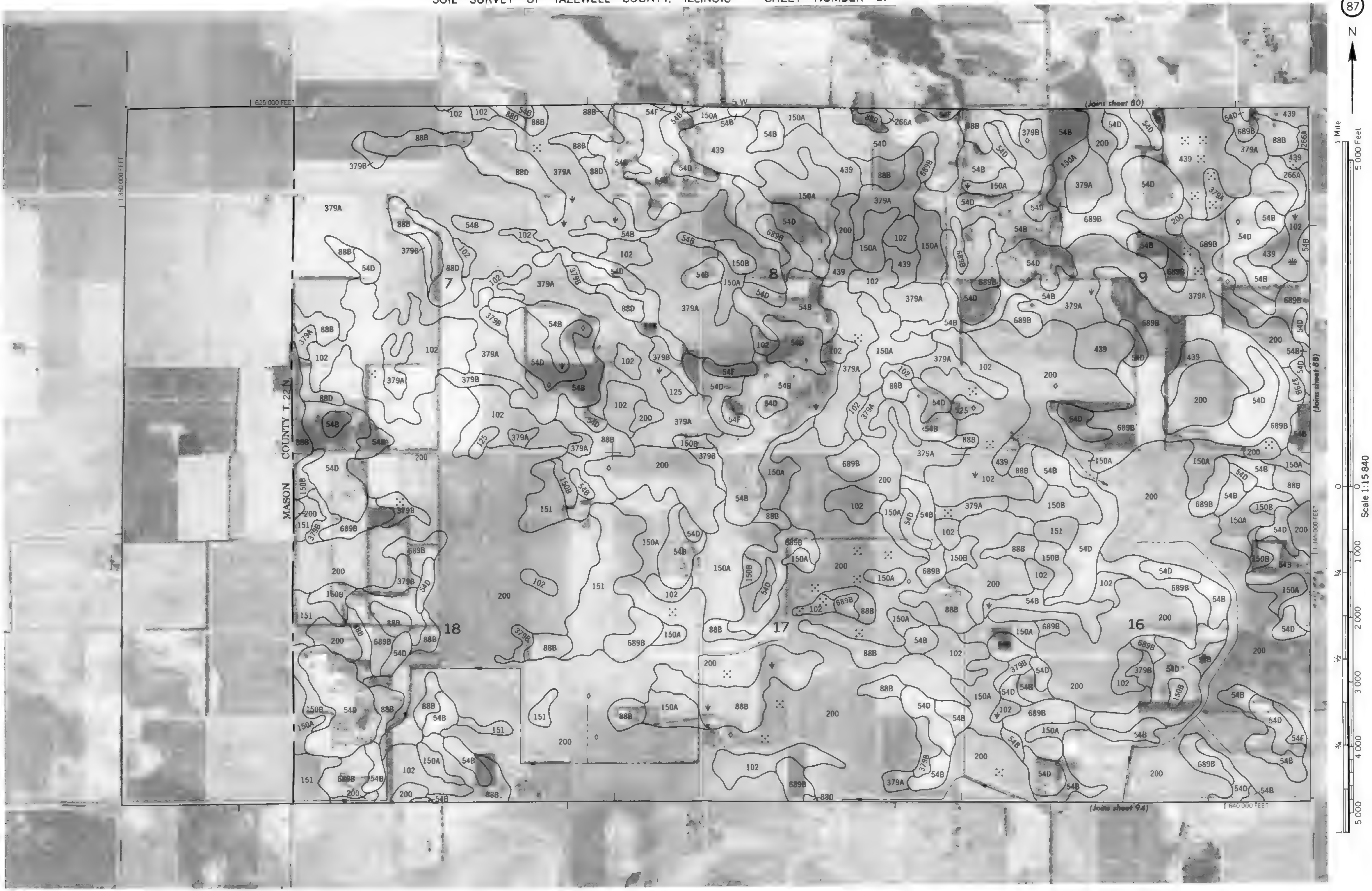
TAZEWELL COUNTY, ILLINOIS NO. 85

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



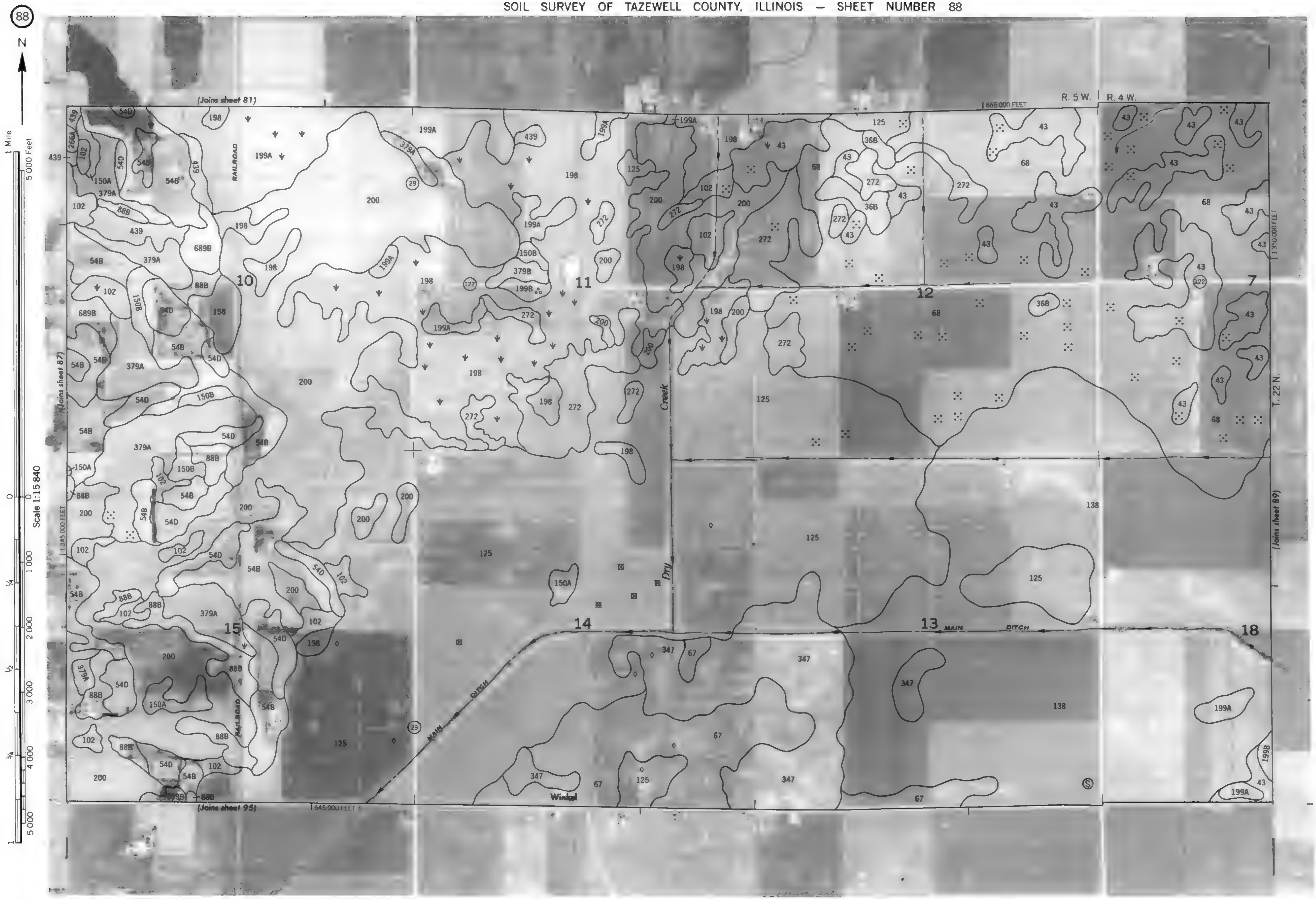
SOIL SURVEY OF TAZEWELL COUNTY, ILLINOIS — SHEET NUMBER 86

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned



TAZEWELL COUNTY, ILLINOIS NO. 87

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned

TAZEWELL COUNTY, ILLINOIS NO. 89

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

9

TAZEWELL COUNTY, ILLINOIS NO. 9

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Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

1 Mile

5 000 Feet

Scale 1:15 840

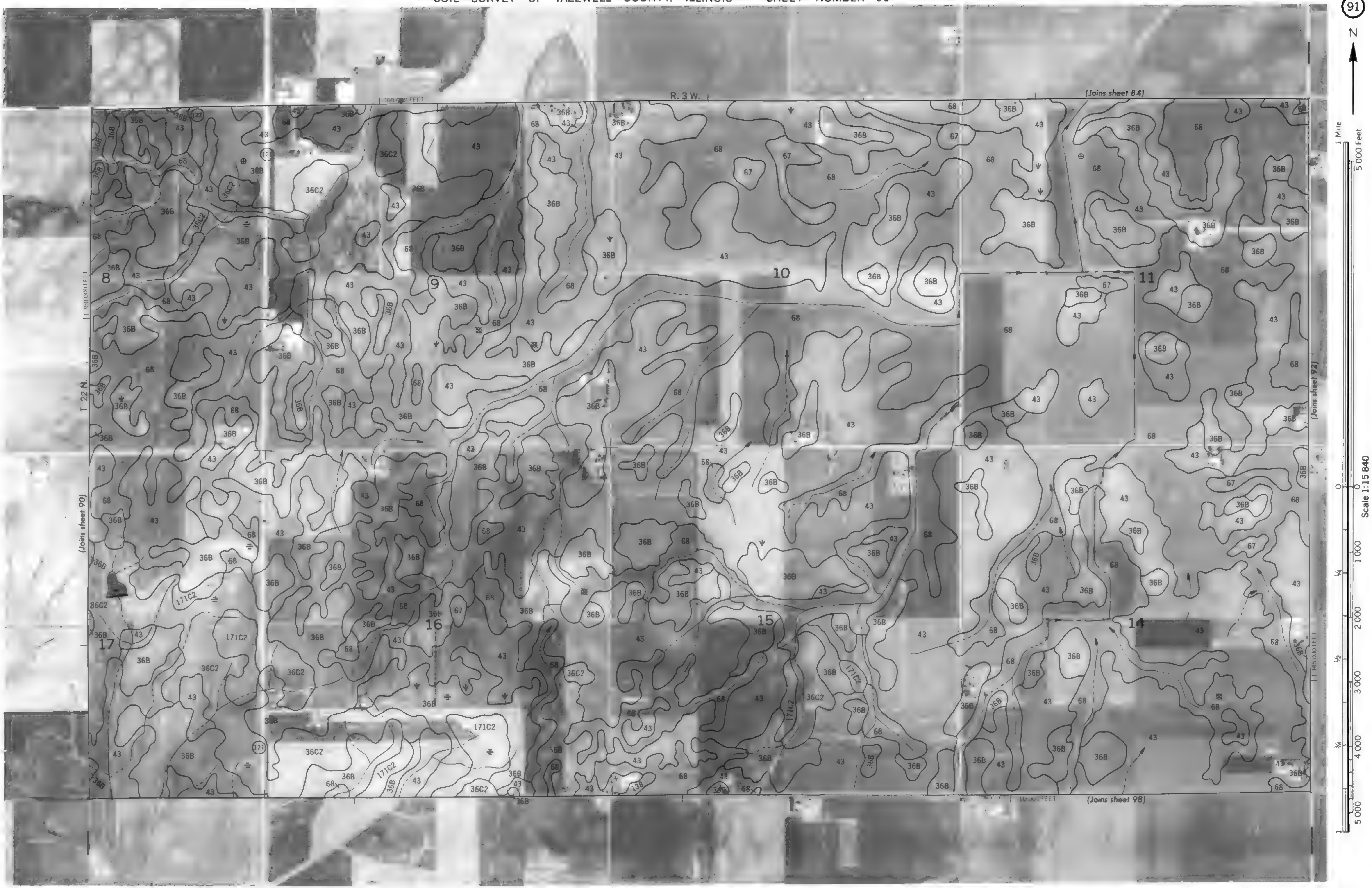
0 1/4 1/2 3/4 1

0 1 000 2 000 3 000 4 000 5 000

SOIL SURVEY OF TAZEWELL COUNTY, ILLINOIS — SHEET NUMBER 90

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

TAZEWELL COUNTY, ILLINOIS NO. 90



TAZEWELL COUNTY, ILLINOIS NO. 91

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

SOIL SURVEY OF TAZEWELL COUNTY, ILLINOIS — SHEET NUMBER 92

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

TAZEWELL COUNTY, ILLINOIS NO. 93

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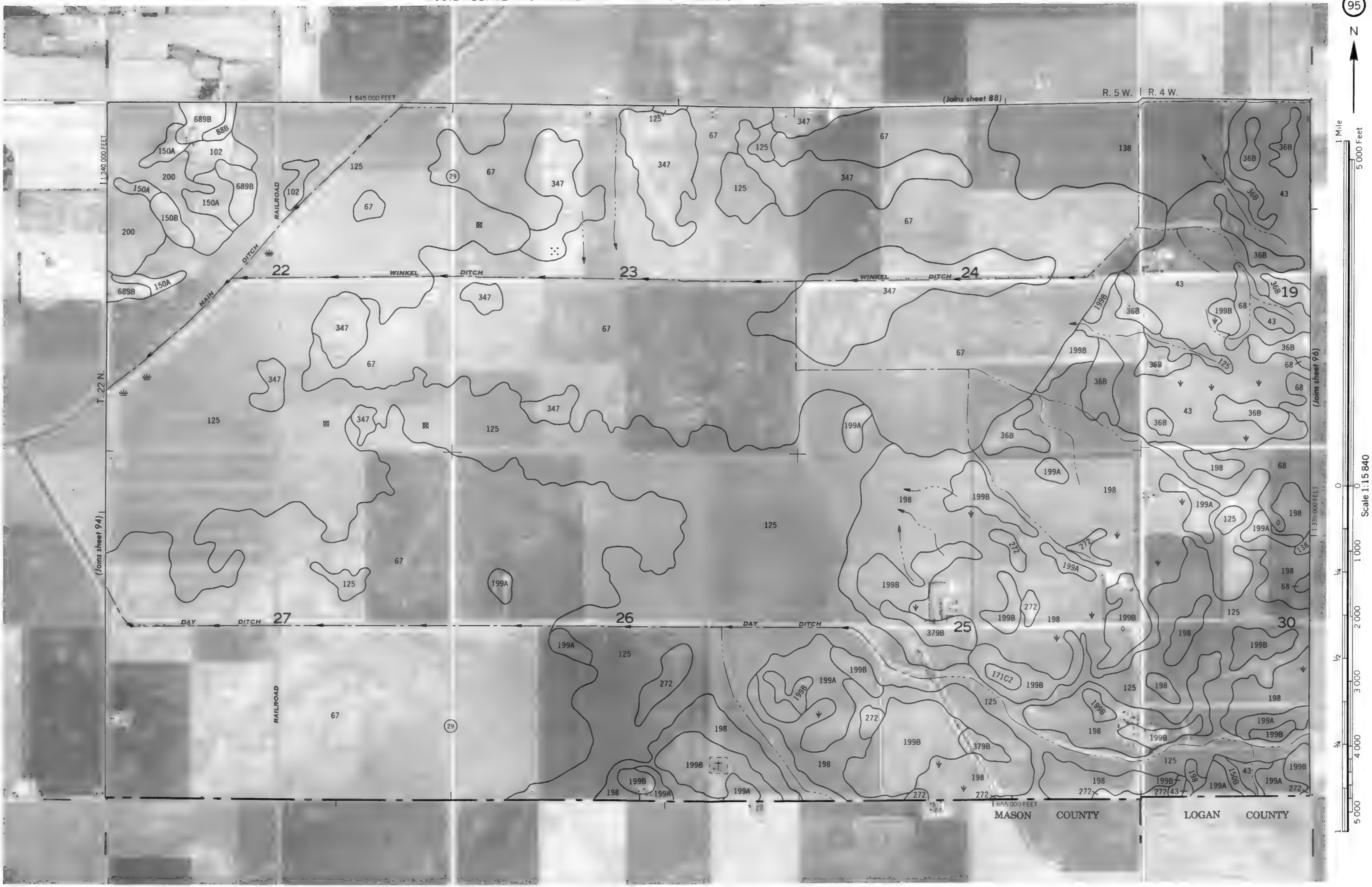
Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned

SOIL SURVEY OF TAZEWELL COUNTY, ILLINOIS — SHEET NUMBER 94

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned

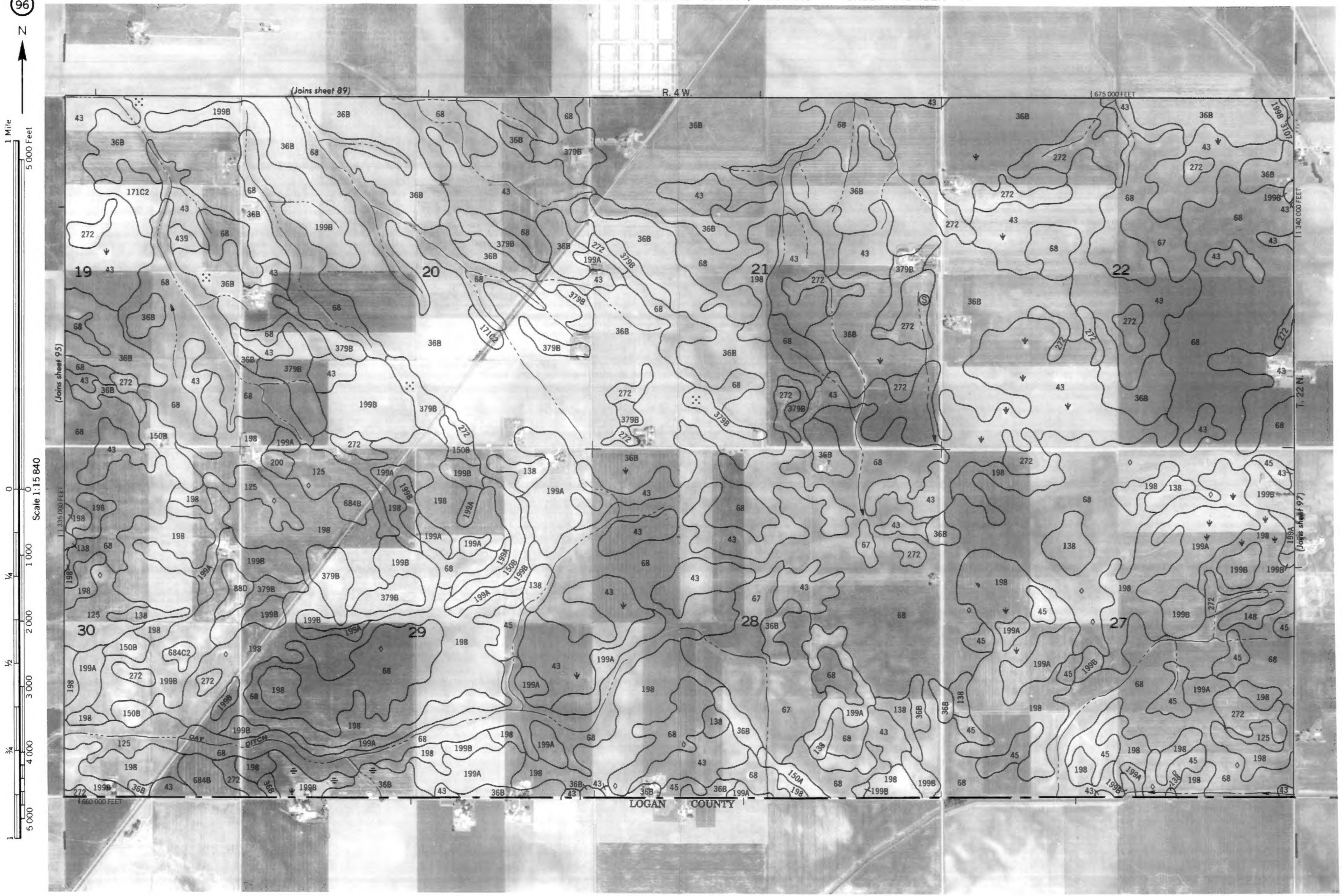


TAZEWELL COUNTY, ILLINOIS NO. 95

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

96

SOIL SURVEY OF TAZEWELL COUNTY, ILLINOIS — SHEET NUMBER 96

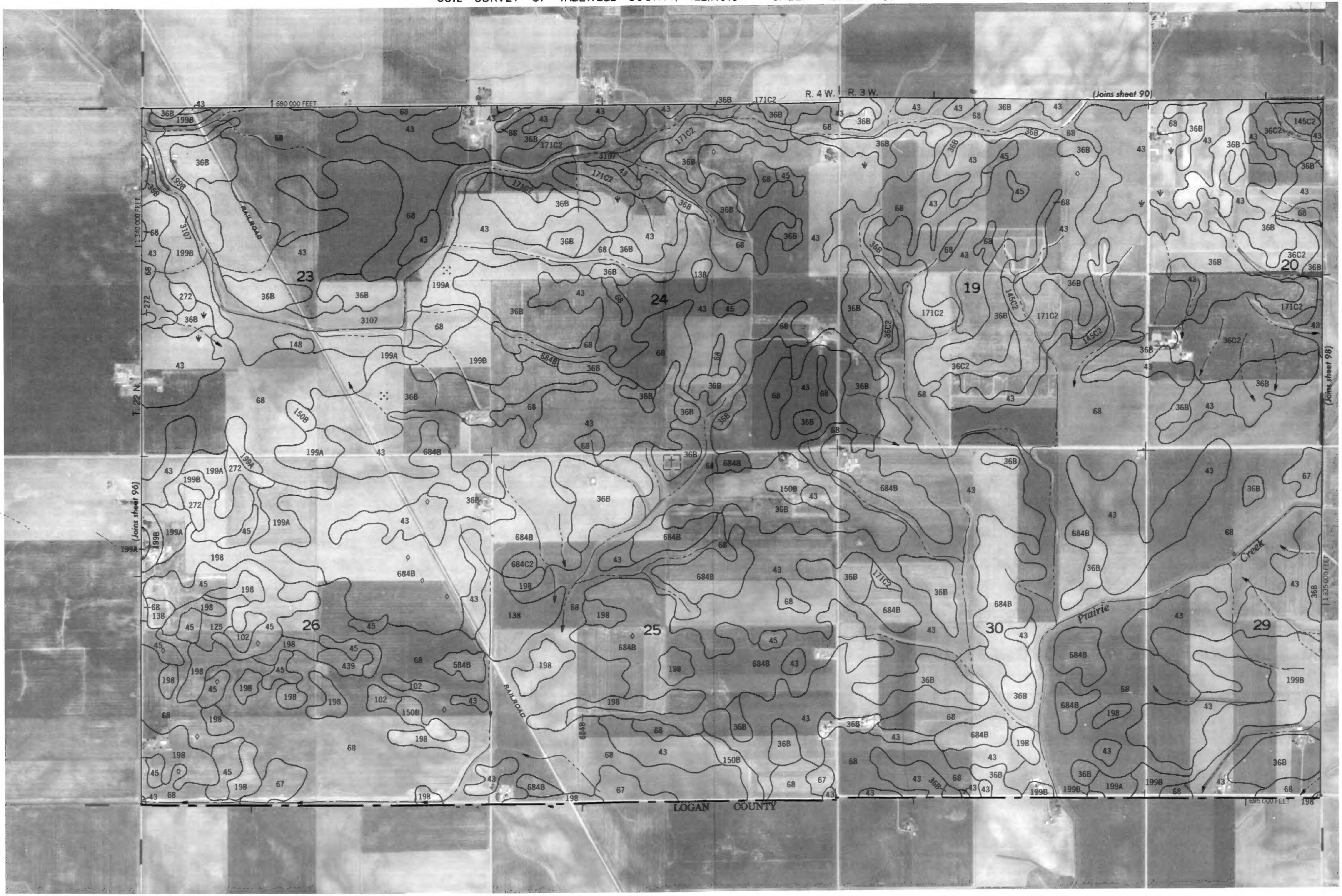


This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

TAZEWELL COUNTY, ILLINOIS NO. 96

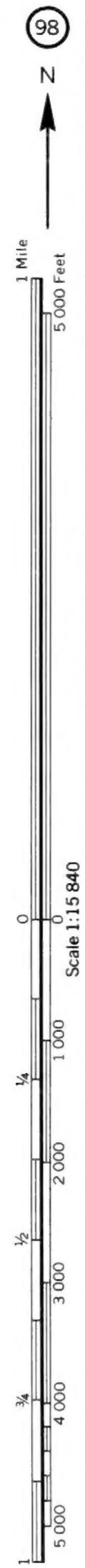
TAZEWELL COUNTY, ILLINOIS NO. 97

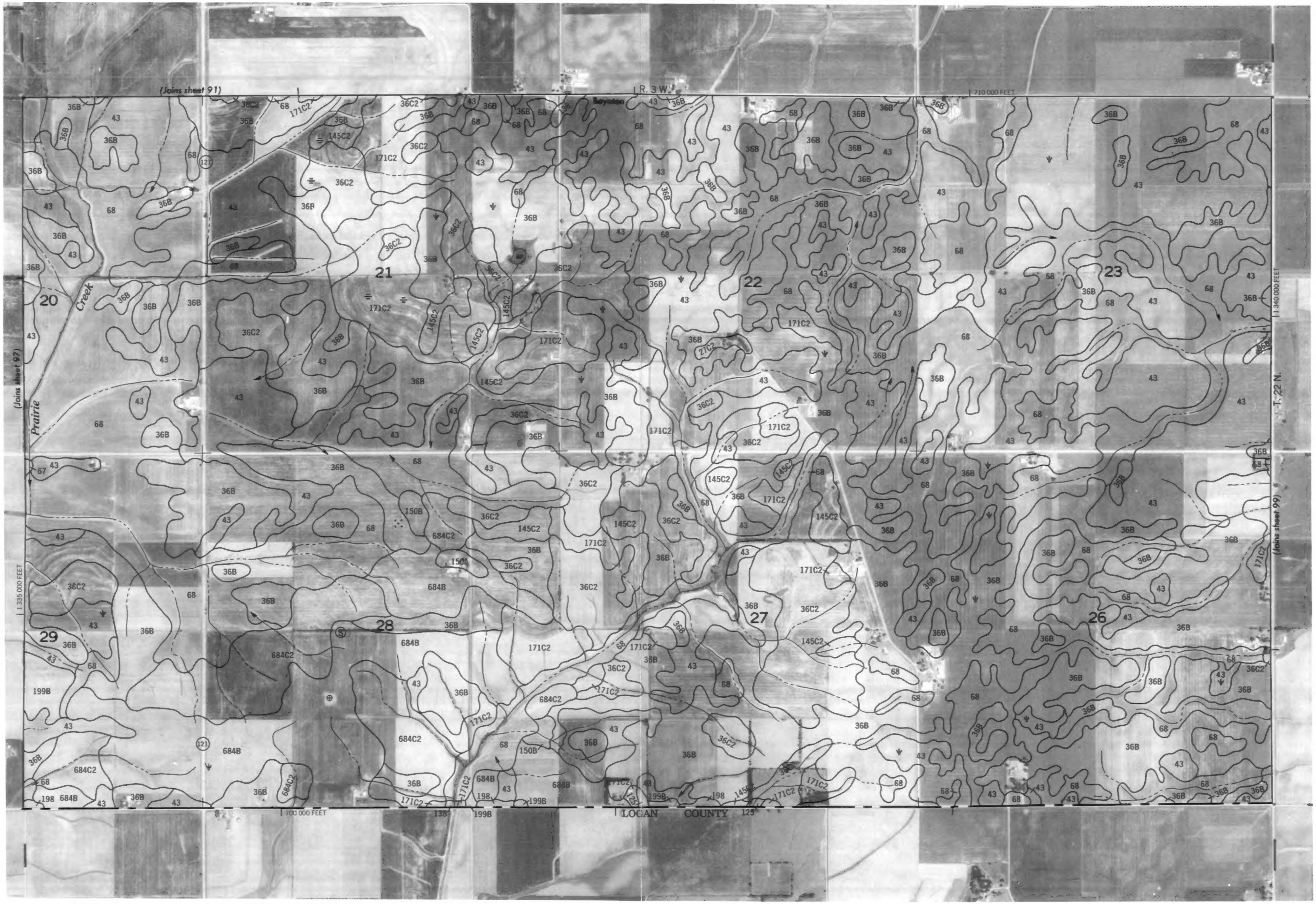
This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



N

1 Mile
5 000 Feet
0
0
1 000
¼
2 000
½
3 000
¾
4 000
1
5 000
Scale 1:15 840





This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

TAZEWELL COUNTY, ILLINOIS NO. 98

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TAZEWELL COUNTY, ILLINOIS NO. 99

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are from **1982** aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.